BEHAVIOURAL TRAINING OF TUTORS IN REMEDIAL READING

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CONTENTS

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ABSTRACT

Reading is a skill necessary for many tasks a person is required to perform as part of everyday living. For both handicapped and non-handicapped persons it is important to foster as many independent reading skills as possible in order that the individual may assume as much self-reliance as is realistically possible. Many individuals who are in need of remedial assistance to read miss out because of lack of teacher-time, and so the concept of recruiting non-professionals to tutor is an important one to investigate. The findings of three studies comprising this thesis indicate that a varied population can successfully be trained to tutor in reading using the same behavioural package of skills (i.e., preview, delayed attention, phonics, and overcorrection). The tutors were paraprofessional aides, moderately mentally retarded adults, and parents and the tutees were moderately retarded adults and six- to eight-year-old non-handicapped children. Tutors' use of the four behavioural skills were measured in addition to use of praise. Tutees' errors and self-corrections were measured. In all studies the effects of intervention generalised across subjects, but not across time, indicating the need for programmed generalisation training. At six months post-treatment follow up, tutees' error rates had reduced further and self-corrections had increased, indicating a delayed arrival of effects. Significant changes occurred after the completion of the study, suggesting that it is important to continue measurements following intervention to accurately gauge a study's outcome.

Reading is a skill seen as essential for daily living. It is important for independence and self-help skills and is related to both employment opportunities and leisure time activities. Using a bus, shopping, cooking, and using the telephone directory are just a few examples where reading skills may well be taken for granted by literate persons (Singh & Singh, in press). Reading for pleasure is another activity often taken for granted.

For learning disabled children and mentally retarded persons these skills are no less essential. For the learning disabled child the current practice of social promotion with chronological age serves as a further disadvantage when reading difficulties are experienced. The heavy weighting given to reading and language skills in other curricular areas such as maths may well inhibit advancement in those subjects because of reading difficulties. Thus the gap between the child's performance level and that of his peers may be widened. For mentally retarded people in institutions, the recent trend for their integration into the community assumes a self-sufficiency not widely evidenced. Reading vocabularies designed to include "protective" words, for example, street signs (stop, walk, bus stop); convenience signs (toilet, men, women, ladies) and warning words such as danger, do not enter, private, beware of the dog, and names of common objects are all especially important for community living. The success of rehabilitation depends on forward planning which should include attention to reading skills, enabling residents to assume as much responsibility for themselves as is possible.

Historically, reading has not been seen as an important skill for mentally retarded persons. There were some early efforts to teach a functional vocabulary of protective, convenience and cautionary words (Wallin, 1924). Other early research reviewed in detail by Singh and Singh (1985), and outlined here concluded that mentally retarded children read below their mental age expectancy levels, especially if they were placed in special classes. It was proposed that the mildly retarded could be taught to read to the second and third grade level, or to the equivalent of second-year schooling.

Very little research has been conducted with moderately retarded children because of a prevailing attitude that they could not be taught to read or count and that such skills preclude the diagnosis of moderate mental retardation (Kirk, 1972). However some studies have shown that moderately retarded children can learn to read more than a few simple words (Davy, 1962; Riese, 1956). Since these early studies our expectations of moderately retarded persons have been modified and there has lately been an attempt to find the most suitable teaching methods to promote reading skills.

This section describes issues that are pertinent to the teaching of reading. These include the diagnosis of reading difficulty, error trends, variability, analysis, and remediation methods.

Diagnosis of reading difficulty

The most popular method a teacher may use to make a diagnosis of reading disability is to administer some form of assessment which requires the child to read orally

(Jenkins, 1979). There are sound reasons for this. It is probably the most convenient way of measuring reading errors informally (Informal Reading Inventories, IRI's) and formally (Burt, Neale), and it is during oral reading that the teacher may be sure that the child is actually reading, a task that may be more difficult to monitor during silent reading. While listening to oral reading it is possible to monitor the types of errors the child makes, note early signs of difficulty, and plan early intervention.

It has been noted that children who read orally with low speed and accuracy tend to score poorly on comprehension measures (Larson & Jenkins, 1978; Nicholson, 1977; Perfetti & Hogoboam, 1975). Goodman (1969) also suggested that oral reading performance indicates the reader's level of comprehension. Nicholson (1977) found in two separate studies that reading was impaired when comprehension was dependent on target words. His work suggested that comprehension skills are directly related to accurate coding ability.

Larson and Jenkins (1978) compared drill with word supply. Drill is the programmed repetition of a target word which has been incorrectly identified, and word supply is the supply of the correct target word following its incorrect identification. Larson and Jenkins found that drill was more effective than word supply in increasing both accuracy and comprehension measures, suggesting that comprehension is to some extent dependent on accuracy.

The data are mixed when teaching for rate. Waechter (1975) working with kindergarten children, provided reinforcement contingent on increased oral reading rate. Their reading rates increased beyond those of the control group.

A study by Fleisher, Jenkins and Pany (1978) found that poor readers who received rate training were able to increase their speed and accuracy significantly but their comprehension skills did not differ from untrained poor readers. A similar experiment by Sindelar (1977) supported the findings of Fleisher et al. (1978). Jenkins (1979) concluded that reading proficiency clearly involves high accuracy, speed, and comprehension of reading, however further exploration is needed to determine what contribution is made by each skill.

Error Analysis

Oral reading instruction can be seen as a relevant component of the general reading programme (Jenkins, 1979) because of the relative ease with which difficulties can be detected. Wixon (1979) suggested that error patterns vary greatly as a result of some complex interactions. Wixon labelled errors as miscues because they are "cued by the interaction between thought and language" rather than random mistakes (Wixon, 1979). Miscues can be categorised by dialect, graphic similarity, sound similarity, intonation, grammatical function, corrections, grammatical acceptability, semantic acceptability, and meaning change (Goodman & Burke, 1973). In this way, miscues can indicate the strategies used by the reader to make sense of what he or she reads. This information can then be used to determine an appropriate teaching intervention. For example, Au (1977) found five types of errors predominating in her study: omissions, partial identity nonmeaningful substitutions, repetitions and self-corrections and concluded that her group would benefit from instruction in use of contextual cues rather than visual-phonic information.

Establishing correct reading levels

Though most teachers agree on the importance of establishing the right reading level for the child, there is little consensus on how to do this. Four methods predominate: assignation of age/grade related texts, achievement tests, basal reading tests, and informal reading inventories.

Age/grade related reading material is often unrelated to reading ability. Achievement tests quantify a child's reading performance relative to other children, and give a grade equivalent score. This score is useful for indicating progress when compared with the child's past grade equivalent score. Difficulties in this assessment method include the differential matching of some tests with instructional material. Jenkins and Pany (1978) and Eaton and Lovitt (1972) found biases between achievement test and reading programmes. These biases are significant when the child is receiving special education. Their classroom performance on curricula material is seen as more important than performance on standardised tests. Achievement tests may often be infrequently administered and indirectly related to classroom performance thereby giving an inaccurate picture of the child's true reading ability. The same applies for basal reading tests, which may be quick and easy to administer but are usually given only once. This one test score does not always reveal the reader's ability accurately.

Informal Reading Inventories (IRI's) were introduced by Betts in 1946 and require oral or silent reading of a series of graded passages. Usually I.R.I.'s sample from each book in a classroom series, enabling measurement on the

materials used for instruction. Word recognition and comprehension are assessed at the differing levels of classroom material. Scores for each reading component across the levels are compared with norms and the student is placed into one of three levels for reading - independent, instructional or frustrational. I.R.I.'s seem to represent the classroom programme most closely, and thus appear to have the greatest face validity of the four methods, but they can still distort the picture of true reading ability. Opinions differ as to whether oral measures only are required or whether oral, silent and isolated words should be included in the measuring sample. Questions still exist about the type of measurement to be used (rate or percent correct), definition of errors level, and the quantitative aspects which indicate independent, instructional or frustrational levels (Pikulski, 1974).

Lovitt and Hansen (1976) developed a modification of the IRI which requires students to read 100 words each from five different reading levels (totalling 500 words). After each segment is read, six comprehension questions are asked which deal with different aspects: recall of facts, sequence of events, interpretation and synthesis, inference translation, and application. Lastly, vocabulary is tested. The teacher tallies the number of incorrect words and categorises the errors. Three calculations are used from each segment: correct words per minute, incorrect words per minute, and the percentage of correctly answered comprehension questions. Placement is decided by computing means of all three calculations from each reading. In general, as grade level increases, mean incorrect rates and comprehension scores increase.

Readers are placed at the level in which the correct rate is 45 - 65 words per minute, average incorrect 4 - 8 words per minute, and average comprehension 50 - 70%. Placement is seen to be effective if there is little difference instructionally between baseline and instructional levels.

Another question arising from Lovitt and Hansen's (1976) work concerns the criteria for optimal level of reading difficulty. Once the child has been placed, instructional effects should be monitored every day to enhance his or her progress (Bohannon, 1975; Jenkins, 1979; Jenkins, Mayall, Peshka & Jenkins, 1974). Very little work other than that of Jenkins and Fleisher (1978), which supports the multiple sample IRI of Lovitt and Hansen (1976), has been completed on informal inventories. More research is needed to clarify the criteria for instructional levels.

Remediation methods

A number of methods may be used by the classroom teacher to improve reading performance. These may include word analysis, phonetic synthesis, silent reading, comprehension, oral reading in groups whereby errors are corrected by the teacher or another child. While these methods may be used successfully for children in the regular classroom, for many receiving special education, they are not successful. The teacher of these children must therefore provide occasions for reading and remediation.

Jenkins (1979) suggests three categories to summarise existing remedial methods: decontextualised, contextualised, and contingency management. Decontextualised interventions concentrate on individual words or part words. Phonics training, preteaching of new words and error

correction procedures for specific words are included in this group. Contextualised strategies concentrate on units which are larger than single words; for example, phrase practice (Eaton, 1972), multiple exposures to text (Lovitt, Schaaf & Sayre, 1970), repeated reading, and hypothesis testing (Dahl, 1974). Contingency management involves taking baseline reading measures before introducing a contingency for improved reading which earns the child some reward. Despite the reported success of this method, the question still exists as to whether the reinforcer encourages the child to improve or rather, give their best reading. Another query is whether the child will continue to improve after the reinforcers have been phased out.

For the purposes of this study, remediation techniques are summarised according to their provision of either antecedent or consequent events.

Recent studies have tended to use examples of Jenkins' (1979) decontextualised strategies: phonics, preteaching words and other error correction procedures. Some researchers have extended this by adding contingency management to their studies.

Antecedent Stimuli

This type of remediation involves the manipulation of stimuli prior to the reading of the target text. Included in this group are previewing, paired reading, multiple exposures, phrase practice and hypothesis/test training.

Previewing exposes the reader to contextual clues before presenting the text to be read. This means looking at the pictures, talking about what may happen in the story, and discussion of unfamiliar events. The aim of this method

is to give the reader a semantic framework around which to build word meaning. This tends to increase self-corrections and decrease oral reading errors.

Wong and McNaughton (1980) investigated the effects of previewing the target text, measuring correct words, errors and their types, and self-corrections. During intervention they provided the child with discussion, identifying unfamiliar concepts before the target text was read. Their results showed a reduction of errors and an increase in self-corrections. Similarly, Singh and Singh (1984) investigated the effects of antecedent stimuli on oral reading errors. Previewing of a target text was compared with previewing of unrelated texts and a no-previewing control condition. They found that oral reading errors decrease when the target text was previewed with the teacher before being read, while the other two conditions produced no change.

Paired reading involves the tutor reading orally just prior to the tutee reading independently. This was explored by Morgan and Lyon (1979) who found that children's accuracy and reading rate increased when tutored by their parents. This technique was successfully modified by Limbrick, McNaughton and Glynn (1985).

Multiple exposures require the child to listen and follow along as someone else reads the passage orally or silently read the passage until a criterion level is reached. Some researchers have found both listening and silently reading prior to reading orally to be successful in reducing oral reading errors (Dahl, 1974; Eaton, 1972; Neville, 1968).

Phrase practice involves the extraction of phrases from the child's reader, and printing them on flashcards to

be given in drill format. Amble and Meuhl (1966) found phrase practice effects following training on phrase reading, but did not use oral reading measures. Eaton (1972) found phrase reading to improve oral reading in one of two boys following training.

Hypothesis/Test training teaches the child to use preceding contexts and graphic stimuli to recognise words (Dahl, 1974). Dahl gave training on a scale of need with progressively more clues given about the word, and found after one year a higher rate of correct words per minute. An attempted replication of that study by Sindelar (1977) did not support Dahl's results.

Consequent Stimuli

Remedial techniques involving consequent stimuli are those in which teacher attention occurs following errors. Various techniques are included in this group of error correction procedures: Word supply, end of page review, word meaning, drill, phonics, delayed attention to error, and overcorrection. Jenkins and Larson (1979) investigated six correction procedures: word supply, no correction, sentence repetition, end of page error review, word meaning, and drill. In this study five learning disabled students were given instruction in each correction procedure for a minimum of seven days. Treatment was assessed with two word-recognition tests the following day after initiation of error correction. Word supply was used as a control condition and was found to be very similar in effect to no correction. Other conditions had small effects but drill produced the best results. Eaton (1972) found less evidence to support drill as an effective error correction

method, however her experimental design may well account for the study's insensitivity to the value of drill.

Singh and Singh (1985) used an alternating treatments design to compare word supply with word analysis against a no-training control. Both error correction procedures were found to reduce oral reading errors, however word analysis was the more effective of the two. Self-correction rates increased in both conditions; for two subjects the increase was greater during word analysis, and for two the increase was greater during word supply.

Phonics or word analysis involves the use of letters, sounds and sound blends to correct reading errors and is frequently used when there is a decoding problem for the child with no attempts made to self-correct. Lovitt and Hurlbut (1974) compared the effectiveness of two different phonics programmes but their results were equivocal and they were unable to draw definite conclusions regarding efficacy of the programmes. They found that compared to baseline measures, there was improvement on specific phonics skills and that errors decreased during phonics training.

Corrective Feedback Hierarchy is a sequence of steps used by the teacher until the child corrects the error: self-correction encouraged; contextual clues are given; words are analysed semantically; phonics; lastly, words are supplied. Hansen (1976) compared the feedback hierarchy (cfh) with phonics instruction and found that in cfh the numbers of errors did not differ significantly, but types of errors changed: meaning change errors were reduced, as were nonsense words, while self-corrections increased. Phonics however produced little or no effect.

Delayed attention to error involves the teacher waiting for a short period of time to elapse or until the child has finished the sentence in which the error was made and then attends to the error. McNaughton (1981) compared two error correction procedures in which one group of readers received immediate feedback in the form of word supply from the teacher and the other group received attention to only one half of their errors, modelling correct words and praising at a lower rate. He found that higher reader accuracy occurred with less direct attention to errors. In another experiment McNaughton and Glynn (1981) investigated the effects of delaying attention for 10 to 15 seconds, in comparison to immediate attention to errors. Working with average readers, they found results supporting those of McNaughton's (1981) study: both accuracy and self-correction rates were lower when attention to errors was immediate. These findings were supported by Singh, Winton and Singh (1985) with four mentally retarded children. Again the delay period was 10 to 15 seconds following an error, and again this was found to be more successful than immediate attention to error in reducing oral reading errors and increasing self-corrections.

Overcorrection is a procedure in which the reader is required to correct the error then repeat the word, followed by a repetition of the whole sentence in which the target word appears. Singh and Singh (1984) compared overcorrection alone as a treatment with overcorrection plus positive reinforcement to determine effects on oral reading errors by four moderately mentally retarded children. Each self-correction was reinforced during a reinforcement condition,

which resulted in a higher rate of self-corrections than the overcorrection alone. The addition of reinforcers may, however, have caused an increase in error rates to gain reinforcement for self-correction. In another investigation of error correction procedures, Singh and Singh (1986a) compared overcorrection with drill. In an alternating treatments design they looked at the effects of these conditions plus a no-training control on oral reading errors by four moderately mentally retarded children. Tests one day after initial reading of the passages showed the two conditions to have reduced oral reading errors, but overcorrection had a greater effect for all subjects during intervention. During the retention tests, however, drill was seen to be slightly superior for mean error rates.

In a combination package of both antecedent and consequent stimuli, Singh and Singh (1986b) assessed a programme consisting of preview, delayed attention to errors, and overcorrection of errors. They used a multiple baseline across subjects experimental design with comprehension probes taken every two or three days across both baseline and intervention phases. Oral reading errors were reduced and comprehension scores increased over the course of the study. Their results highlighted a relationship between remediation and oral reading errors and a less clear relationship between remediation and comprehension. Singh (in press) used an alternating treatments design to measure overcorrection effects when used in individual or group training formats. A no-remediation control condition was also employed. Results indicated that fewer errors were made under the two training formats when compared to the no-remediation control,

but performance was equally good under both individual and group training formats. Generalisation probe data suggested that incidental learning during the group training condition increased word recognition skills.

Training models

One way of employing these methods which requires less one-to-one time from the class teacher is to engage tutors to follow a programme designed by the teacher which would help the child in difficulty. Tutoring is a method of remediation that is becoming increasingly accepted as both beneficial for academic (Cohen, Kulik & Kulik, 1982) and non-academic behaviours (Solomon & Wahler, 1973). Further, attitudes of both tutors (Jones, 1981) and tutees (Morgan & Lyon, 1979) have been seen to improve in the target area. One novel way of tutoring was introduced by Whalen and Henker (1971), who trained retarded hospital residents to act as behaviour change agents for another group of residents, who were then trained to perform the same role for a third group of residents.

As early as the first century A.D. Quintilian, a Roman rhetorician suggested the use of older children to tutor younger children, and by the seventeenth century Spanish Jesuits had developed a tutorial programme whereby one student tutored ten others (Paolitto, 1976). In 1797, Bell reported the success of this tutorial method in providing elementary education and improving behaviour. Perhaps more widely known are the efforts of Lancaster in the early 1800's to educate working class children using monitors in a modification of the tutorial system (Allen, 1976; Kaestle, 1973; Paolitto, 1976).

As funding for public education increased, and teaching standards rose there was a decline in the tutorial system (Krouse, Gerber, & Kauffman, 1981), however, there were similar social concerns that caused its reinstatement in America in the 1960's. Anticipation of teacher shortages, desire for novel approaches, and the anti-poverty programmes in addition to the promise of increased free time for teachers were some of these considerations. Krouse et al. (1981) have cited a plethora of studies published in the 1960's and 1970's that supported this interest. Such studies have led to the furthering of tutoring as a teaching method and the need for investigation of both short and long term effects. Tutoring has been undertaken in maths (Rust, 1970; Stainback, 1971); social skills (Thelen, 1969); science (LeBoeuf, 1968); language (Davis, 1968) and reading (Cloward, 1967a, 1967b; Erickson, 1971; Gardner, 1973; Hassinger & Via, 1969; Kreutzer, 1973; Rogers, 1969).

Not only are children being trained to tutor each other, but parents are now being seen as a valuable recourse for influencing their child's academic performance and increasing their motivation to attend in school (Criscuolo, 1974; Tingey-Michaelis & Pendler, 1983). Tizard, Schofield and Hewison (1980) found that children who were tutored by their parents had a reading advantage over those children who did not receive tutoring. A study by Whalen and Henker (1971) which employed mentally retarded adolescents and adults as both tutors and tutees provided the model for the third study in this thesis. During a nine month period professional therapists taught five mentally retarded adolescents and young adults to tutor younger retarded people

in basic adaptive skills, using behavioural techniques. The tutees were given 60 individual training sessions followed by 60 play sessions. A matched-control group was given 60 play sessions and 60 training sessions. Whalen and Henker found that the training groups gained significantly in basic social behaviours over the play groups in each phase of the investigation. In addition, follow up measures taken 15 months later showed that skills had been retained by both the tutors and tutees. This training method was labelled as a pyramidal tutoring model.

Table 1 presents a summary of reading studies chosen because of tutor and tutee characteristics. Peer tutors were seen as either same-age or cross age and these studies were relevant to the second study in this paper. Parent studies were selected as demonstrations of the possibility of training parent groups with diverse backgrounds to act successfully as tutors. In addition, they demonstrate the viability of both individual (Cooke, Heron, Heward, & Test, 1982) and group training formats (Greer & Polirstok, 1982).

Insert Table 1 about here

As can be seen from Table 1, a wide variety of tutoring populations, and interventions were used. Twenty-three studies employed peers as tutors, and in 12 of these tutors were described as learning disabled, emotionally disturbed or delinquent. In 11 of the studies tutors were described as normal or above average in reading or their academic levels were not specified.

In three studies the tutees were described as mildly mentally retarded, in one study mentally retarded, and in 19

Table 1

Summary of Reading Studies Employing Tutors

Authors	Tutors	Tutees	Comparison Group	Intervention Frequency	Available Teacher Time	Procedure	Design	Results	Followup
Chiang, Thorpe & Darch (1980)	L.D. 5° graders n = 4	L.D. 2-3° graders n = 4	-	15-20 mins daily	Not specified	4 conditions 1. Baseline 2. Modelling 3. Tutoring of all 60 words 4. Tutoring on errors.	Multiple baseline across students	Groups gained on word recognition of morphemes they were taught.	-
Cooke, Heron, Heward & Test (1982)	Normal 1° grader n = 1	Down's syndrome 1° grader n = 1	-	25-30 mins daily	Not specified	1. Tutor practised Dolch sight words 5 mins. 2. Tutee practised tutor 5 mins. 3. Testing 4. When all words recognised consistently = maintenance.	Pre-post test	Baseline of 4 words increased to 77 words recognised.	1 week later
Dineen, Clark & Risely (1977)	L.D. 9-12 yrs n = 3	L.D. 9-12 yrs n = 3	Control Condition	20-30 mins daily	Not specified	Teacher modelled procedure to tutor 1 child = tutored 1 child = tutee 1 child = control	Simultaneous treatments	Tutors = Tutees improved on words they tutored and were tutored in. Controls did not.	-
Elliotyson & Parsonson (1985)	Normal 10-11 yr olds n = 4	Reading delayed junior children n = 4	-	10 mins 3 times/wk	Not specified	Pausing Prompting Praising	Multiple baseline	Tutors increased pausing, prompting praising; decreased modelling of correct answers.	
Epstein (1978)	L.D. in self contained classroom n = 100	L.D. primary level in self-contained classroom n = 100	1. Peer tutoring in maths 2. Teacher instructed 3. Self instructed	15 mins daily 1° ½ of academic year.	Not specified	Students low on word recognition = tutors. Tutees randomly assigned to experimental and control conditions.	Experimental group	1. Experimental group did better than control on criterion-referenced tests. 2. Exptal group covered more words than group 3. 3. No significant differences between the groups on time used to cover the words.	-

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Erickson & Cromack (1972)	Under achievers 7 grade boys n =12	Under achievers 3° graders n = 12	Non tutor & non tutee classmates	30 mins twice weekly	Not specified	Informally structured tutor read to tutee for 10 minutes then played oral language games.	Pre-post testing	Tutors differed from controls in both pre and post testing. Tutees also differed from controls. Campbell's regression showed differences more clearly than t-tests.	-
Greer, Polirstok (1982)	9° grade delinquent males age 14-16 yrs n = 3	Reading delayed 8° graders n = 15	None	Daily	Not specified	Tutors worked with 5 tutees each Measured : tutors on task reading responses in their own class; tutors approval of tutees; tutees reading responses.	Multiple ABCBC A-tutors trained for 5 sessions B-tokens for tutor reinforcement given C-tokens withdrawn D-	During B- tutor reading and on-task scores increased in non-experimental setting. Tutee reading scores increased as a function of tutor approval.	-
Howell, Kaplan (1978)	Reading delayed 3°, 4°, 5° graders n = 5	Reading delayed 3°, 4°, 5° graders n = 5	Reading delayed 3°, 4°, 5° graders n = 5	10 minutes daily 9 days each baseline, intervetion	For duration of sessions	Tutors listed to tutees, corrected errors. Errors were reread. Investigator monitored tutor behaviour, gave feedback of instructional behaviour. Controls read silently.	AB design	Peer tutors learned to use instructional procedures, tutees reading improved controls stayed the same.	-
Jenkins, Mayall, Peschka & Jenkins (1974)	Older non-handicapped children	1. L.D. & EMR 7-10yrs n = 13 2. L.D.3° graders n = 4	Teachers instructed small groups	2 10 minute sessions daily a. 4-8 days b. 4 days c. 5 days	Not specified	Each child received daily sessions under 1-1 cross age tutoring and small group conditions. Tested after each session.	Single subject multi-treatment design.	All students made gains in tutorial conditions.	
Jones (1981)	Students at least 2 years ahead of tutees in reading		6° & 7° graders scoring 2 or more years below grade level on Gates McGintie Reading Test	45 mins daily 4 days a week.	Not specified	Gates McGintie Tests pre-post test scores analysed for both tutors and tutees. Also used interviews, questionnaires, surveys.	Pre-post	Tutees and tutors made significant reading gains over expected reading gains. Anecdotally improvements in self-concepts, school attitudes, attendance, co-operation and self-confidence.	-

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Lamport (1982)	Reading disabled 6° graders n = 24	Elementary school students in remedial reading or L.D. class	Control group attended remedial reading class	30 mins. 3 days per week	Tutors given training twice weekly	Tutors trained twice weekly. Pre-post measures of auditory vocabulary, phonetics analysis skills, reading comprehension, classroom behaviours, withdrawn inattentive behaviours, reactions towards school	Experimental group	Tutors achieved significantly higher scores in phonetics analysis skills & positive attitude to school than control subjects. Tutees achieved higher scores in auditory vocabulary and more positive reactions to school than control subjects.	-
Landrum (1970)	High school students with reading scores 2 years or more below grade level. Low family income n = 100	Reading disabled 4°, 5° & 6° graders	None daily 6 weeks	Ø hours	Not specified	Tutors were paid to work with tutees during summer school	Pre-post testing	Tutors gained 8.3 months in reading. Tutees gained 4.7 months.	
Lane, Pollack & Sher (1972)	8°, 9° graders with maladaptive behaviours on Burk's Behaviour Rating Scale n = 8	3°, 4° grade patients at community health centre for learning or behaviour problems n = 8	None	2 days per week 7 months	Not specified	Pre- and- post test scores on Metropolitan Achievement Test were analysed	Pre-post	Tutors gained 19 months and tutees 14 months on reading scores. Teacher ratings of tutor behaviour improved, increased achievement, motivation, greater maturity, less hostility.	-
Limbrick, McNaughton & Glynn (1983)	10-11 yr old under-achievers n = 3	6 yr old under-achievers n = 3	6-8 yr old classmates controls n=3 10-11 yr old classmates n = 3	twice weekly recordings	Not specified	Tutors modelled correct word, reinforced correct behaviour, used Morgan & Lyon's paired reading	3 phase multiple baseline	Changes in accuracy, self corrections, and rate of progress but training in tutoring needed first. Increased comprehension skills increased book levels.	-

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McCracken (1979)	Non-handicapped secondary level n = 15	Special Education Secondary level n = 51	Teacher instructed n = 32	Daily, 12 weeks	Not specified	Tutees taught daily by peers or teacher. Half used data based instructions - daily self-charting of progress	Experimental pre-post on Slosson Oral Reading Test	1. No significant differences between teacher vs. peer taught groups on word recognition or comprehension scores. 2. Students taught by teachers using data based instruction scored higher on word recognition than students not using data based instruction by peers or teachers. 3. No significant differences between reading-comprehension scores of students taught using data-based instruction and students taught without data based instruction.	-
Maher (1984)	Emotionally disturbed high school students, average IQ n = 8	E.M.R. children	Second group who started tutoring later	Twice weekly for 10 weeks	Not specified	Tutors trained to teach: maths, language, reading	Multiple baseline across subjects.	Tutors gained in on-task behaviours, reduced inappropriate behaviours. Tutees improved responses on tests and quizzes.	-
Oakland & Williams (1975)	Normal n = 46	Delayed reading 3° & 4° graders n = 33	12 control	1. 15 mins 10 mins reading 10 mins spelling daily 2. 10 mins	Not specified	12 - control on class programme 12 - total tutorial programme of word review, new words, oral reading	Experimental group pre, post testing	Supplementary programme better than total tutoral programme. Both better than control in comprehension, word knowledge scores.	-
Rodick & Henggeler (1980)	1. SMART n = 7 undergrads 2. PUSH parents 3. Std. reading	56 low achievers 7° graders (divided into 4 groups	Control science class	1 hr daily for each group	SMART - not specified PUSH - once weekly phone calls twice weekly visits Standard Reading Class 1-2 ratio	SMART tutors - 5 hrs training in vocab. oral reading, silent reading, vocab review.	Experimental, Group Pre-post testing on WISC, PIAT	Short and long term gains for SMART Long term gains for PUSH.	One 6-months later gains maintained

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Authors	Tutors	Tutees	Comparison Group	Intervention Frequency	Available Teacher Time	Procedure	Design	Results	Followup
Russell & Ford (1983)	7° graders average/above average in reading and maths	Not described n = 20	Teacher taught control group n = 12	1 hour daily	At all times	1. 1-1 instruction by peers following individualised instructional plan	Pre-test Post-test	Group had essentially similar pretests. Both gained over 3 months but tutor trained gained more. Teachers said: No more than 2 tutors per classroom, and no more than 2 tutor pairs.	-
Sindelar (1982)	Elementary students	2°,3° & 4° graders in resource programme for reading	Control group receiving 1. Oral reading word recognition from peer tutors or 2. hypothesis testing from teachers	20, 15 minute sessions	Not specified	Subjects pre & post tested on oral reading, word recognition and close comprehension. Taught hypothesis/ testing by peer tutors and compared with controls.	Pre-post testing	Hypothesis/Testing group did better than word recognition tutorial group on the close comprehension measure. All other comparisons gave non-significant results.	-
Smith & Pfeiffer, (1977)	E.M.R. 8-9 year olds n = 3	E.M.R. 5-6 year olds n = 3	7 control classmates	30 mins daily	Not specified	Tutors trained first to enthuse, establish rapport with tutee, in relaxed atmosphere + reinforcement and correction.	Pre-post testing	Reported increased self-esteem, competency for tutors, teacher gained more free time tutee gained greater learning potential	
Willis, Morris & Crowder (1972)	Normal 8° graders	L.D. 4° graders n = 8	-	30 mins daily for 15 weeks	Not specified	6 tutors tutored each other under supervision of an older student. 4 students were tutored individually by an older student.	Pre-post testing	Both groups made greater gains than expected.	-
Wingert (1981)	High school students	Elementary students in self-contained classrooms and resource rooms	No treatment control	25 mins daily for 10 weeks	Not specified	Pre- and post-test scores of E-B Beginning Reading Placement Test and Woodcock Reading Mastery Test were analysed for tutees and control group	Experimental, Group	No significant differences in word mastery - but significantly greater gains for tutees on Beginning Reading Placement	-
Parsonson & Dawson-Wheeler (1980)	Experimenter	10 yr old aphasic boy	-	20-25 mins daily 98 sessions		Measured accurate reading, writing 1. Dolch words 2. 28 phonemes, digraphs 3. 47 sentences, phrases Probes	Multiple baseline	Significant gains in both reading & writing	1 at 7 weeks

Table 1

Summary of Reading Studies Employing Tutors

Authors	Tutors	Tutees	Comparison Group	Intervention Frequency	Available Teacher Time	Procedure	Design	Results	Followup
Gang & Poche (1982)	3 sets of parents	Reading delayed 8-9 yr olds n = 3	Expected mainstream gain	4 times weekly for 7 weeks	2 training sessions prior to intervention then 4 others during intervention. Trained parents during school hours.	Recorded: correct presentation of stimuli - giving correct instructions - appropriate correction procedure - correct recording	Multiple baseline across subjects. Pre-post testing	All 4 children made more self corrections at school during intervention at home. Maintained low level of self corrections during home readings.	-
Love & Van Biervliet (1984)	Parents	8-10 year n = 4 mildly retarded	-	Once weekly observations	Not specified Parents trained during school hours	Measured: attention to errors delayed attention modelling prompting - use of praise - accuracy of reading - number of errors, self corrections and prompted corrections	Multiple baseline across behaviours	Mothers learned to monitor, children made greater than mainstream expected gains.	1 at 11 weeks
Meacham (1969)	Parents	Normal, reading deficient children n = 3	-	Once weekly conferences with teachers	Not specified	Trained parents to change negative comments about school and reading	Pre-post test	2 improved 1 did not	1 year later
Morgan & Lyon (1979)	Parents	Reading retarded 8=11 yr olds n = 4	-	15 mins daily at home	Not specified	Parents read with children in paired reading. Trained to use more reinforcement	Pre-post testing	Accuracy and comprehension gains of up to 1 yr 7 mths.	-
Trovato & Bucher (1980)	Peers Teachers	Children grades 2, 3 & 4 reading deficient n = 69 23 - peer tutored 23 - home based reinforcement	23 control	Peer tutoring 30 mins daily at school. Home based 30 mins daily & exchangeable points for rewards at home.	Not specified	Children matched in triads then assigned to 3 different groups.	Pre-post testing	Peer tutoring - improved oral reading but peer tutoring & home based reinforcements were best.	-

Table 1

Summary of Reading Studies Employing Tutors

Authors	Tutors	Tutees	Comparison Group	Intervention Frequency	Available Teacher Time	Procedure	Design	Results	Followup
Scott & Ballard (1983)	Mothers, classroom teachers n = 4 each	11-12 year olds reading delayed n = 4	-	3 random samplings of reading sessions in homes and schools each week 6 measures	Not specified	Tutoring both at home and school. Measured delayed attention, % modelling, praise for self corrections, prompted corrections	Multiple baseline across subjects	Both parents & teachers could be trained to use procedures over followup tutors increased level of responding Tutees reading gained $\bar{X}$ = 28 months	One at 3 months
Searls, Lewis & Morrow (1982)	Parents	25 1° & 2° graders	25 1° & 2° graders as controls	20-30 mins daily for 20 weeks	Not specified	Tutored in maths, language reading, parents taught to tutor in pre-reading skills	Experimental, Pre-post Group	1° graders gained significantly over controls. 2° graders - both controls and experimental group gained after pre-test.	-
Shuck, Ulsh & Platt (1983)	Parents Low S.E.S.	75 3-5 graders	75 low S.E.S. no tutoring	Daily	At beginning midway and at end of school year	Points given for classwork and work done at home - word lists - games - books Points tallied, exchanged for rewards	Experimental Pre & post test	Statistically significant main effect for primary independent variable - tutoring by parents	-
Sittig (1982)	550 families			15 mins daily	Not specified	Parents given package 'Reading in a rainbow' - books, games, activities - 8 activities per week		Greater enthusiasm for reading	-
Tizard, Schofield & Hewson (1982)	Teachers, Parents	Children in middle infant, top infant 1° & 2° yr juniors	Control (1) Extra teacher help (2)	(2) 4-half days at each school	Not specified Researcher visited homes 2/3 times/week	6 schools assigned at random to 3 groups 1. Extra teacher help 2. " parent help 3. Control	Experimental pre-post testing	Both extra teaching and parent tutoring improved reading performances.	-
Coatsworth, Smith & Parsonson (1985)	2 residential child care workers	2 14 year olds with reading deficits	-	10 minutes 3 times/week	Not specified	Glynn's remedial homebased programme measured pre-post training tutoring: behaviours & reading of their tutees	Multiple baseline	Following training a high rate of tutoring behaviours, gains in pupils reading	One at 3 months

studies learning disabled. Intervention frequencies and available teacher time varied for all. Most studies scheduled intervention daily, but available teacher time was not specified except by way of tutor training.

In 15 studies control groups were employed, in eight groups no comparison groups were specified. A design using a no-treatment control can account for concurrent variables in the subjects' school experiences which could be responsible for gains made other than by tutoring. For example, a new teacher might effect gains to both tutees and control group alike. For this reason, group designs employing a control are seen as stronger than those studies without a control-comparison group. In all of the studies, including pre-post designs, and those including no-treatment controls, benefits for tutees were reported as a result of the training intervention. Further, in nine studies gains were reported for tutors (Dineen, Clark, & Risely, 1977; Greer & Polirstok, 1982; Jones, 1981; Lamport, 1982; Landrum, 1970; Lane, Pollack, & Sher, 1972; Limbrick, McNaughton, & Glynn, 1985; Maher, 1984; Smith, & Pfeiffer, 1977). Gains were found in motivation, on-task behaviour, attitudes to school, and reading performance. Only two studies reported follow up procedures (Cooke, Heron, Heward, & Test, 1982; Rodick, & Henggeler, 1980). In both of these studies gains achieved during intervention were maintained.

Similar points can be noted from the studies which employed parent or paraprofessional aides as tutors. There were 12 such studies in all, two of which described the tutors as aides, one used both teachers and parents, one used peers and parents, and the rest used parents only.

The tutees were described in four studies as normal but reading delayed, in one study as mildly retarded, aphasic in one, and in three the academic levels of the tutees were not specified. For all studies the intervention frequency was described as either two or more times weekly. For three studies control group comparisons were specified and in one (Parsonson & Dawson-Wheeler, 1980), a reversal phase served as a control-comparison. In all of these studies the children receiving tutoring made greater reading gains than did the control groups.

In all studies, tutors' pre- and post-training behaviours were measured. In one study parents' negative comments about reading were modified (Meacham, 1969); in the others, behavioural skills were trained. All studies found that parental training in tutoring was of more benefit than untrained parent tutoring. Five studies describe follow up procedures with the gains to tutees still being maintained. All mention the changes in attitude to their child's reading by the parents and the child's gains in class reading performance.

Several reviews of existing studies were not included in the table. Among these are Glynn and McNaughton's (1985) review of 11 studies carried out using the Glynn, McNaughton, Robinson and Quinn (1979) method of helping children to read. In this method, parents were taught to pause, prompt and praise following their child's reading errors. In the review, six studies employed parents as tutors, four studies employed other children as tutors, and one study employed residential childcare workers as tutors. All studies described gains to the reading performances of the children

who received tutoring, when measures on both standardised reading tests and graded book levels were made. Feldman, Bowman and Feyen (1983) reviewed four behaviourally oriented studies which took place in-home, after school, in-school, and at summer school. They found that tutoring led to improvements in reading, and positive changes in attitude to school, as well as an increased sense of self-efficacy.

The three studies in this thesis used four behavioral skills, each of which has been used successfully to tutor mentally retarded adults. The purpose of the studies was to determine whether the four skills (preview, delayed attention, phonics and overcorrection) could be combined to increase the independent reading skills of two different populations: normal but reading delayed children, and mild to moderately mentally retarded adults. As few other researchers have done, generalisation probes included to assess for generalised use of tutoring skills with other readers, and follow up measures were taken, to assess the effects of training over time.

STUDY 1

Tutoring of moderately mentally retarded adults by paraprofessional volunteers

The main objectives of this study were (1) to determine the effectiveness of training five paraprofessional volunteers as reading tutors; (2) to teach independent reading skills to five moderately mentally retarded adults; and (3) to assess the efficacy of a behavioural package of error-correction procedures. The inclusion of five other moderately retarded adults throughout the study served to assess generalisation of skills to new readers. In addition, it was hoped that this study would indicate the reduction of professional supervision, while still providing tutees with important one-to-one tuition by paraprofessional aides.

METHOD

Subjects and Setting

Five adult females participated as volunteer tutors. Three of the five had been trained as primary school teachers, one had trained as a kindergarten teacher, and the other had no teaching experience with children or mentally retarded persons. One (Philippa) had trained as a reading tutor for Specific Learning Disabilities (SPELD) prior to this study. The volunteers had each responded to invitations from the assistant director to participate in a reading programme.

Five adult trainees assessed as moderately retarded on AAMD criteria (Grossman, 1983) who worked at a vocational resource centre for the intellectually handicapped,

participated as tutees. In addition, five other moderately retarded adult trainees were tutored at random points throughout the study. Details of both tutors and tutees are presented in Table 2.

Insert Table 2 about here

The experimenter was a graduate student completing her master's degree in psychology.

The vocational resource centre caters for 47 mild to moderately retarded adults who spend their day working in one large main workroom. This workroom is partitioned into several different areas by small shelves giving the effect of an open plan design. Training sessions were conducted four mornings a week in the centre's assessment room (3m x 6m) adjoining the main workroom. Informed consent was obtained from the families of the trainees involved before this study commenced and the protocol for the study was approved by the administration of the Society for the Intellectually Handicapped.

Stimulus Materials

Books from the Trend Approach series (Falk & Bird, 1975) provided the reading material for this study. This series consists of stories which are graded in terms of reading age and were written to appeal to the adolescent reader with reading difficulties. None of the trainees was familiar with the reading material prior to the study. The books chosen for the study were assessed to be at the reading level of each student immediately prior to this study. The reading levels were assessed using the Glynn (1979) method of counting errors made on passages of 50 words in

Table 2

Description of subject characteristics

Tutor	Age (yrs)	Tutee	Age (yrs)	Full-Scale I.Q. (WAIS)	Degree of Retardation (AAMD criteria)[a]
Helen	48	Peter	22	48	Moderate
Sue	36	Sue	40	49	Moderate
Veronica	50	Maureen	37	53	Moderate
Philippa	54	Ralph	25		Mild
Rachel	21	Margaret	25	51	Mild
Generalisation Probes					
		Bruce	25	73	Mild
		Karen	26	58	Moderate
		Peter Wh	25	49	Moderate
		Wayne	23	60	Moderate
		Tracey	26	55	Moderate

[a]Grossman (1983)

length. In Glynn's (1979) study, parents had their children read a 50-word passage. If there were fewer than four errors the passage was judged to be too easy, and if there were more than 10, too difficult for the child. That is, appropriate error level was judged to be between 8% and 20% of words read.

In this study each trainee was required to read five 50-word passages. An error rate of between four and ten words per sample indicated the appropriate level. The texts used during intervention were 100 words long for all sessions.

Response Definitions

Behaviours were measured for both tutor and tutee on a score sheet (Appendix A). Errors and self-corrections were scored for the tutees. An error was defined as a mismatch between the printed word in the text and the tutee's oral response to that word. A self-correction was defined as occurring following an error and involved the tutee correcting an error in one attempt, without attention from the tutor. Measures of tutor behaviour included attention to error, which may have been verbal or non verbal, and four primary measures: preview, delayed attention to error, phonics and overcorrection.

Preview involved placing the story in context by prior discussion of the pictures associated with the text. New words were discussed as was the story, with no actual pointing to the new words before the tutee began to read.

Delayed attention involved leaving any error unattended until the end of the sentence or for 15 seconds, whichever came first. At that point the tutor would supply the correct

word. Phonics involved the tutor assisting the tutee to sound out the word using sounds, sound blends, and syllables, rather than supplying the correct word. This condition was added to the preview and delayed attention conditions. Overcorrection required the tutor to help the tutee to sound the word out, then for the tutee to repeat the correct word five times, followed by a repetition of the sentence in which the word appeared.

Data Collection

The experimenter was present for three of the four training sessions conducted each week between 9.00 a.m. and midday. Each reading session was recorded on audio tape and one session per week was video taped to assess the reliability of the independent variable.

Reliability

Prior to reliability rating, an independent observer was trained to assess 25% of all audio and video tapes for each tutor. This was done by first selecting randomly the tapes to be assessed, then training the observer using recordings of reading sessions not designated for rating. Samples were taken from the baseline condition and the observer was trained to score the response of the tutor and the tutee. When agreement between the independent rater and the experimenter was greater than 85% for more than five consecutive training periods, reliability checks were initiated. Interrater agreement was calculated using a word-by-word analysis method (Kazdin, 1982). This was computed by dividing the number of agreements by the number of agreements plus disagreements and multiplying the resultant quotient by 100, to give a percentage reliability. An average

interrater agreement of 92.64% was obtained for the dependent variable, with a range from 78-100%, and a 100% agreement was obtained on the independent variable.

Experimental Design

A multiple baseline across subjects and skills design (Baer, Wolf, & Risley, 1968) was used with each subject to compare the effects of the four conditions: preview, delayed attention, phonics and overcorrection on the behaviour of both tutors and tutees.

Procedure

The study consisted of the following components:

Baseline. The tutor was told to assist the tutee in any way she felt was appropriate for a reading lesson. No specific guidelines were given as to how this should best be done except that each tutor was to say before starting the lesson: "Here is a story I want you to read. Try your best not to make any mistakes". This condition was in effect for three sessions.

Intervention comprised a sequence of four remediation procedures which were instituted sequentially. Prior to the introduction of each new skill the experimenter explained and demonstrated the skill before the tutor read with the tutee. Written instructions outlining the procedure were also given to the tutors (Appendix B).

1) Preview. Before the tutee was asked to read the tutor was required to preview the story. Similar to the Wong and McNaughton (1980) and Singh and Singh (1984, 1986) studies, the tutor provided a background to the story, and both tutor and tutee discussed the story before it was read. The title was included as a cue and any new words, phrases

and expressions were introduced orally, without being visually identified in the text. Meanings of new words in the target text were discussed and tutees' questions about the text were answered. The tutee then read the target text. This condition was in effect for five sessions.

2) Delayed attention required the tutor to wait until the end of the sentence before attending to the tutee's error (McNaughton & Glynn, 1981; Singh et al., 1985). If the tutee paused after making an error, delayed attention was provided 10 seconds later and the correct word supplied. This condition was in effect for ten sessions.

3) Phonics required the tutor to help the tutee to sound the error word out, stressing medial vowels, consonant blends, sound blends, letter translocation and diphthongs (Lovitt & Hansen, 1974). This condition was in effect for eight sessions.

4) Overcorrection involved delaying attention to the error, applying the phonics procedure to correct it, then asking the tutee to repeat the word five times. As with Singh (in press), Singh et al. (1984) and Singh and Singh (1986), the tutee was then required to repeat the sentence in which the error word appeared. This condition was in effect for 12 sessions.

Follow up. Two weeks after the conclusion of the last intervention phase, follow up observations commenced. During this period treatment conditions were in effect. Observations were scheduled once a week for the next ten weeks during which time measures were taken between four and ten sessions for all the reading pairs. A final post-treatment

check was made six months later of tutee error rates and self-corrections.

At random points throughout the study five other trainees were assigned as tutees to test for generalised use of the tutoring procedures. The tutors were asked to take another trainee for reading but given no instructions as to what skills to use. In this manner generalisation of teaching skills to other readers was assessed.

RESULTS

Tutor Behaviours

Overall the tutors used the training skills with consistency but as shown in both Figure 1 and Table 3, the percentage use of correct tutoring skills varied between tutors.

Insert Figure 1 and Table 3 about here

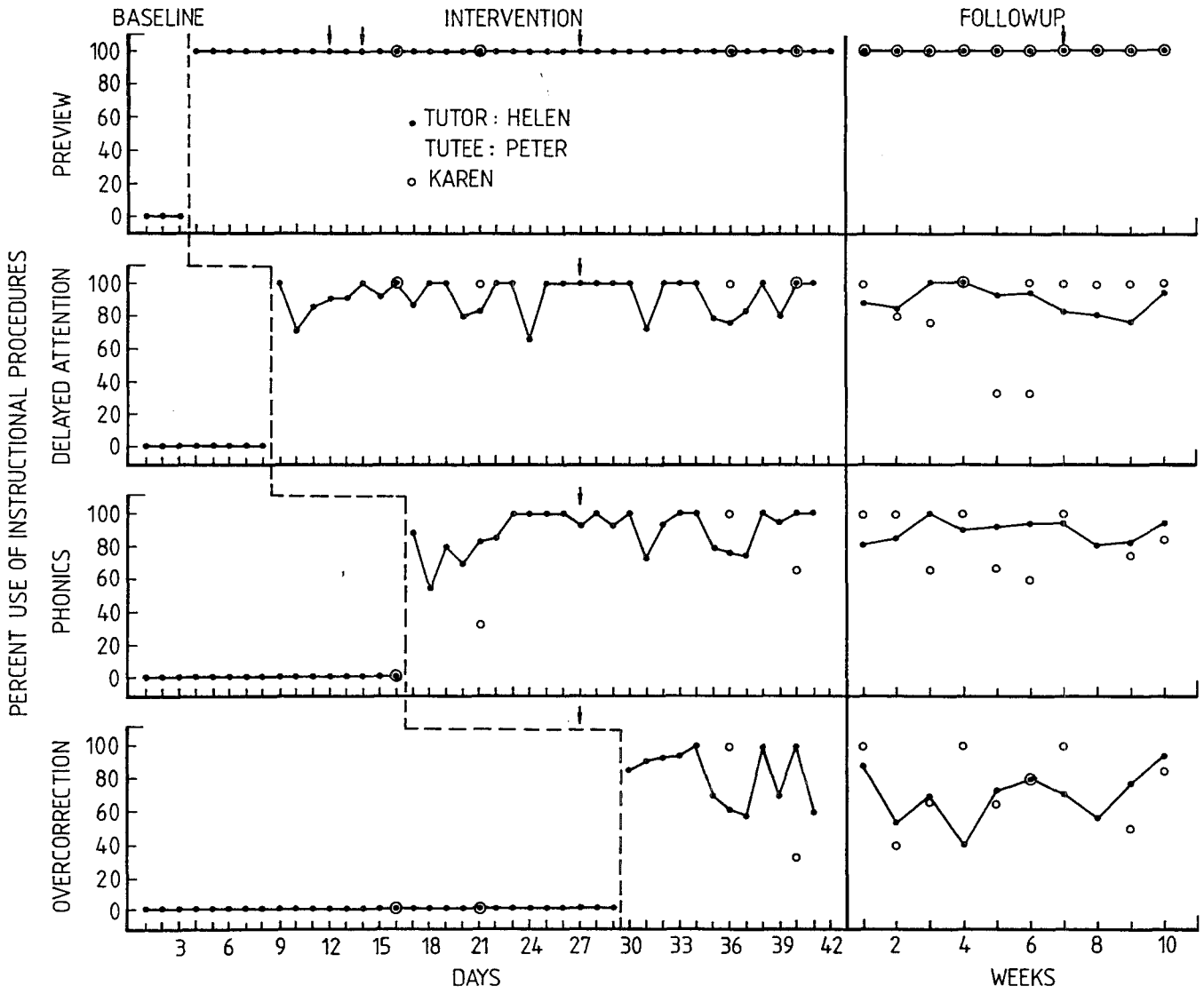
At the conclusion of the final intervention, all tutors used each skill with a high degree of accuracy. Follow up observations indicate a slight decline in the use of these skills but, in general, the data in Table 3 show that the mean percentage use of instructional procedures varied between 84% to 94% across tutors.

Tutor responses across training conditions

1) Preview. One tutor, Veronica, used this skill prior to its training. Following its introduction, previewing was used almost consistently by three volunteers, Philippa and Veronica being the exceptions.

2) Delayed attention. This skill was not used at all during baseline, but following introduction was used by all tutors on average between 89% and 98% (see Table 3).

Figure 1. Percentage correct use of target skills by volunteer tutors. Arrows indicate changes in tutees' reading levels. Gaps indicate days missed.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PREVIEW
DELAYED ATTENTION
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OVERCORRECTION
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80
60
40
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TUTEE : PETER
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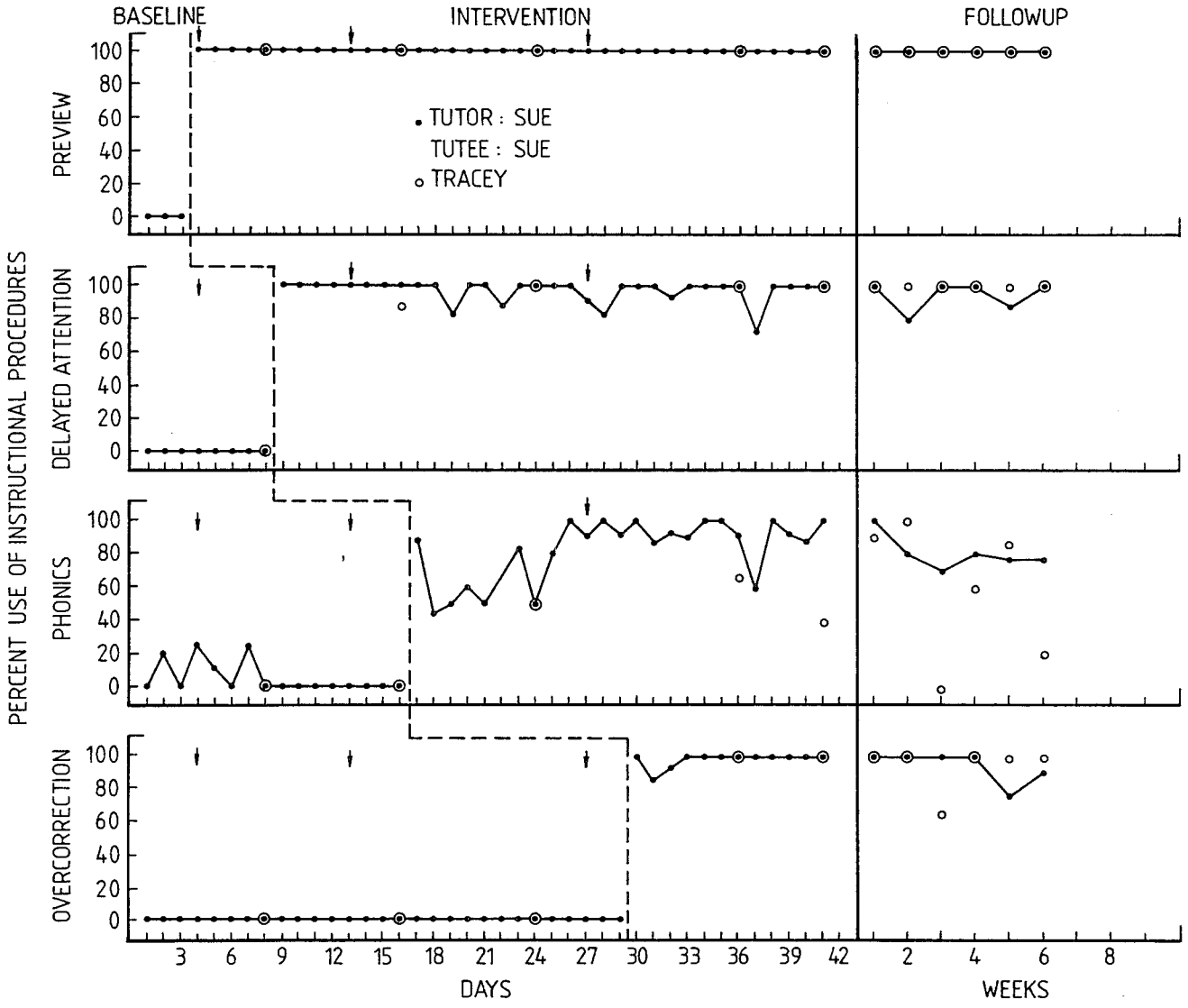
DAYS
2 4 6 8 10
WEEKS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TUTEE : SUE
TRACEY
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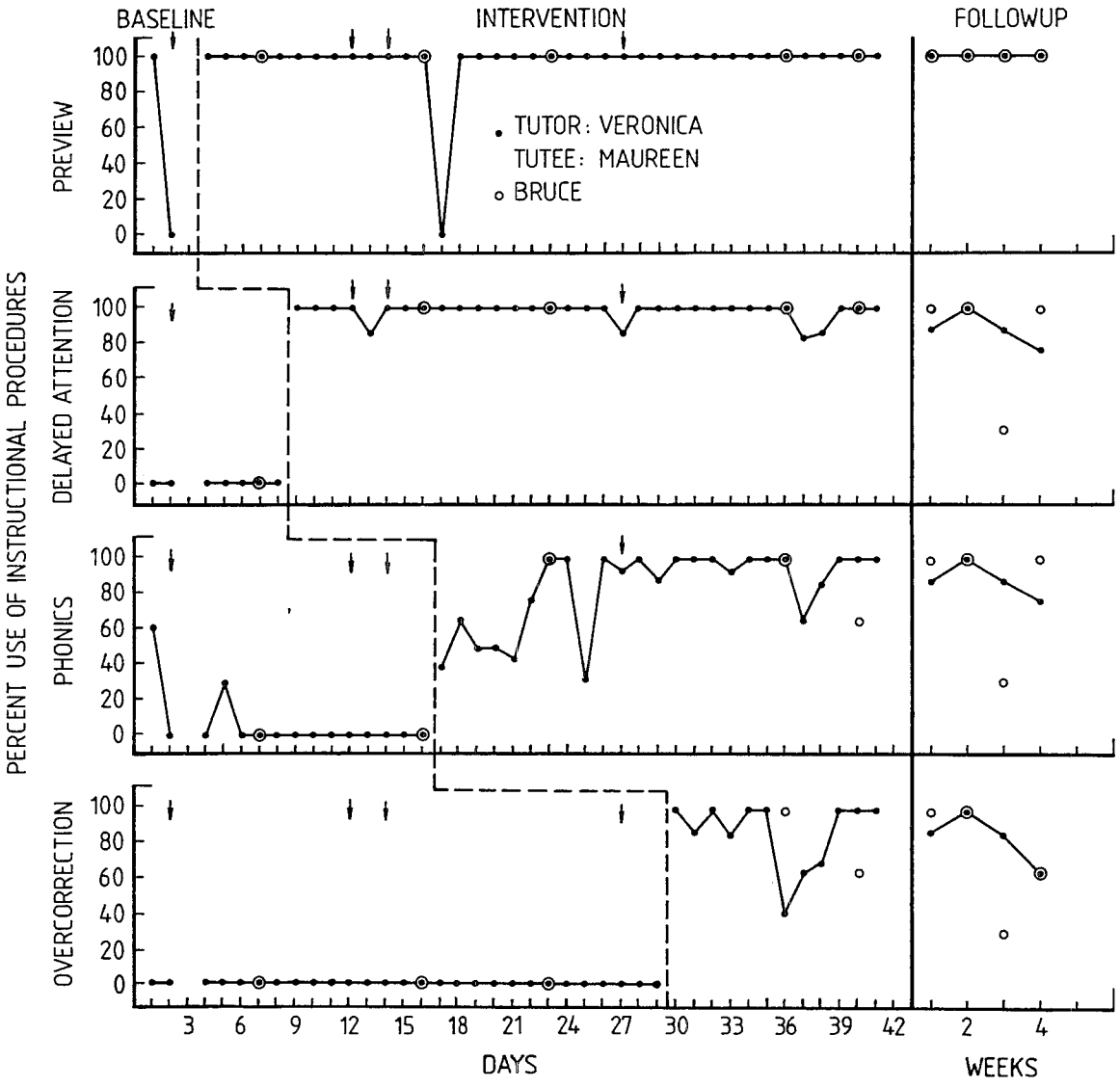
DAYS
2 4 6 8
WEEKS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PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: VERONICA
TUTEE: MAUREEN
BRUCE
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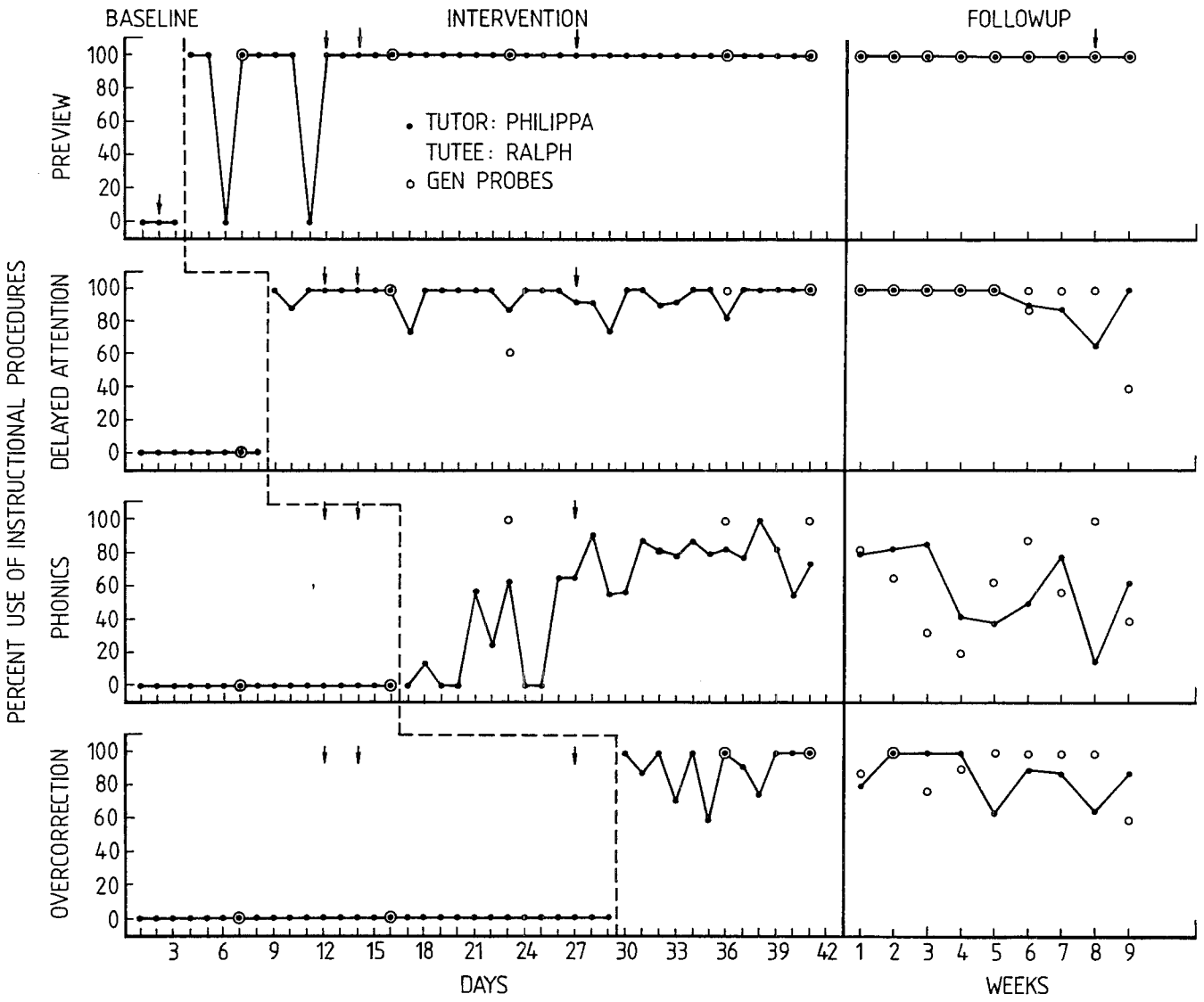
DAYS
2 4
WEEKS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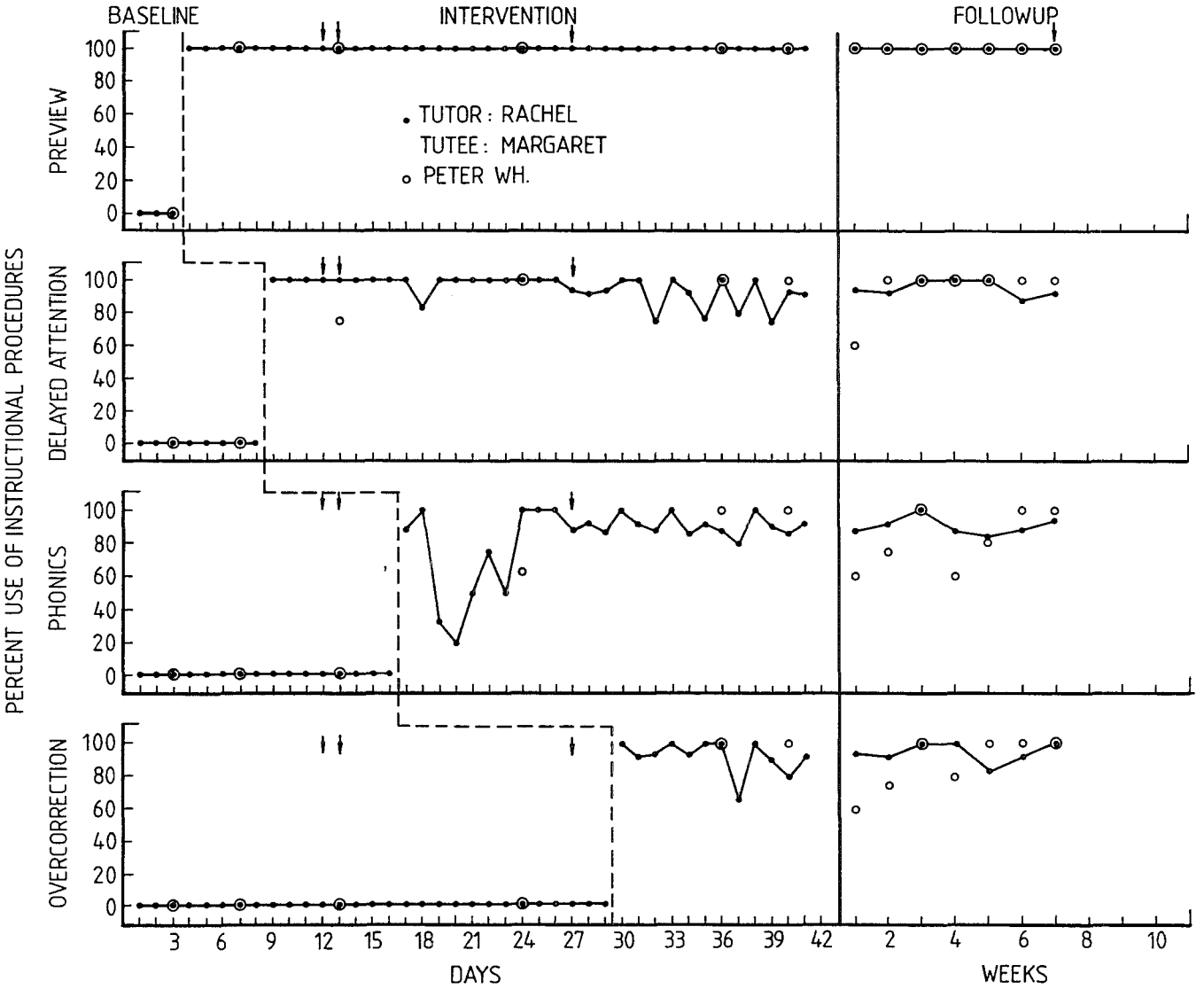
DAYS
1 2 3 4 5 6 7 8 9
WEEKS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INTERVENTION
FOLLOWUP
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
PERCENT USE OF INSTRUCTIONAL PROCEDURES
TUTOR: RACHEL
TUTEE: MARGARET
PETER WH.
0
20
40
60
80
100
3 6 9 12 15 18 21 24 27 30 33 36 39 42
DAYS
2 4 6 8 10
WEEKS

Table 3

Mean percentage use of instructional procedures

	Veronica			Rachel			Helen			Sue			Philippa		
	B	T	F	B	T	F	B	T	F	B	T	F	B	T	F
Preview		97.6	100.0		100.0	100.0		100.0	100.0		100.0	100.0		95.1	100.0
Delayed Attention		98.2	88.3		95.1	89.8		93.5	90.6		97.0	96.6		96.2	94.5
Phonics		83.4	82.3		79.0	78.9		86.7	90.0		82.4	82.5		57.1	58.2
Over-correction		87.8	85.5		92.3	97.5		82.3	70.6		98.3	95.3		90.5	85.0
Means		91.8	89.1		91.6	91.6		90.6	87.8		94.4	93.6		84.8	84.4

B = Baseline

T = Training

F = Follow up, initiated two weeks after final intervention

3) Phonics. Of all the skills, this intervention shows the most pronounced variations in usage (see Fig. 1). During baseline phonics was used inconsistently by only two tutors, Veronica and Sue. Following training, it was used on average with a frequency of over 79%, with only Philippa using it less, at 57% (see Table 3).

4) Overcorrection was not used at all during baseline but following training was used for more than 85% of the errors attended to (see Table 3).

In general, Table 3 shows that for all tutors except Helen, phonics was used the least during training. Helen's lowest use was of overcorrection. This trend was repeated during follow up. Both preview and delayed attention were used with higher frequencies than phonics or overcorrection. Philippa used both phonics and preview less frequently than the other four tutors. Delayed attention was used most by Veronica during training, but by Sue during follow up. Phonics varied between 57% (Philippa) and 87% (Helen). Overcorrection was used most by Sue (98%), and least by Helen (82%).

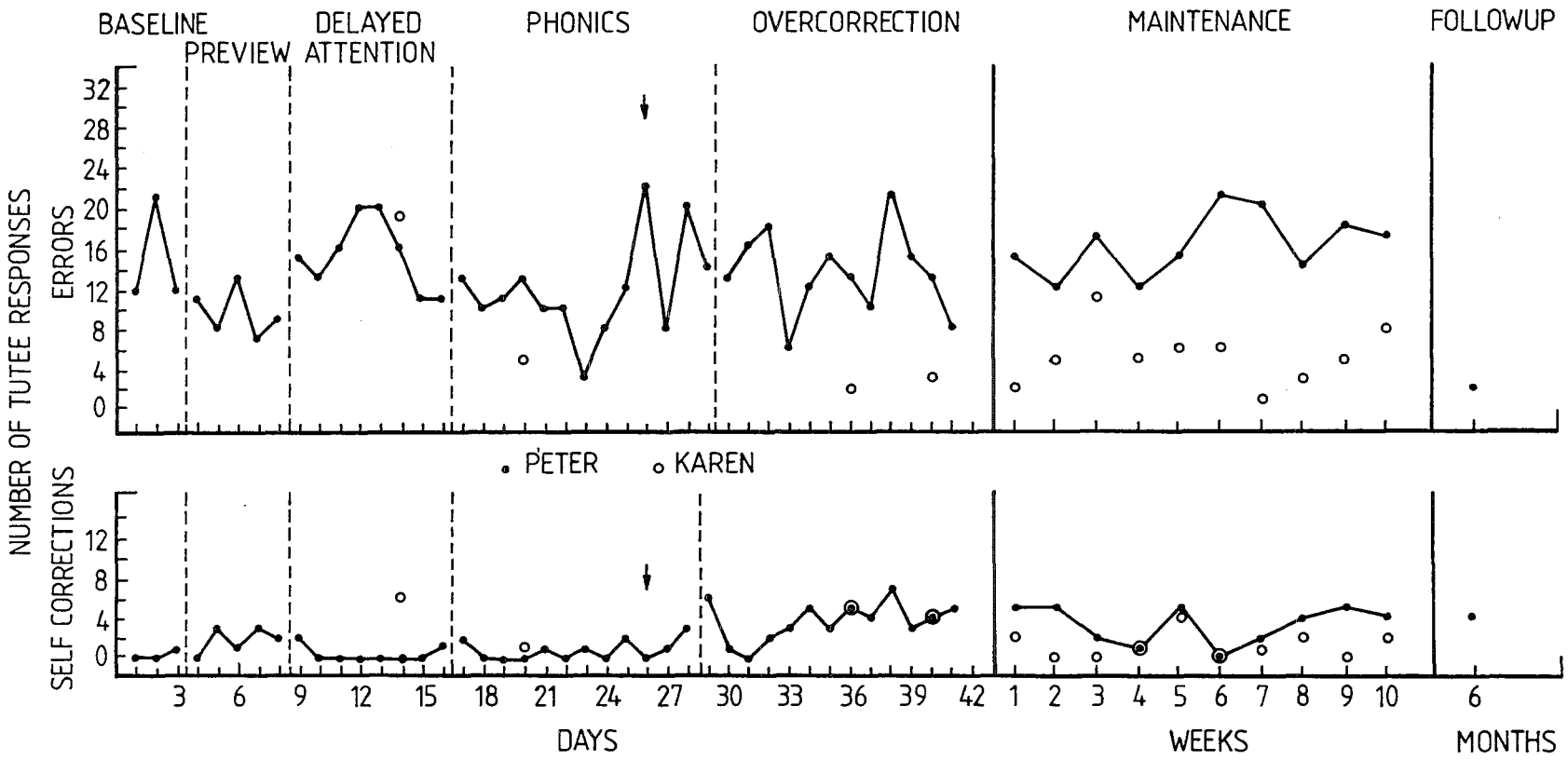
Despite the variability evident in Figure 1, the use of trained skills increased for all behaviours. Follow up checks showed that the skills were maintained above baseline levels.

Tutee Responses

Mean numbers of errors and self-corrections are presented in Figure 2 and Table 4.

Insert Figure 2 and Table 4 about here

Figure 2. Tutees' errors and self-corrections per 100 words. Arrows indicate changes in reading levels. Gaps indicate days missed.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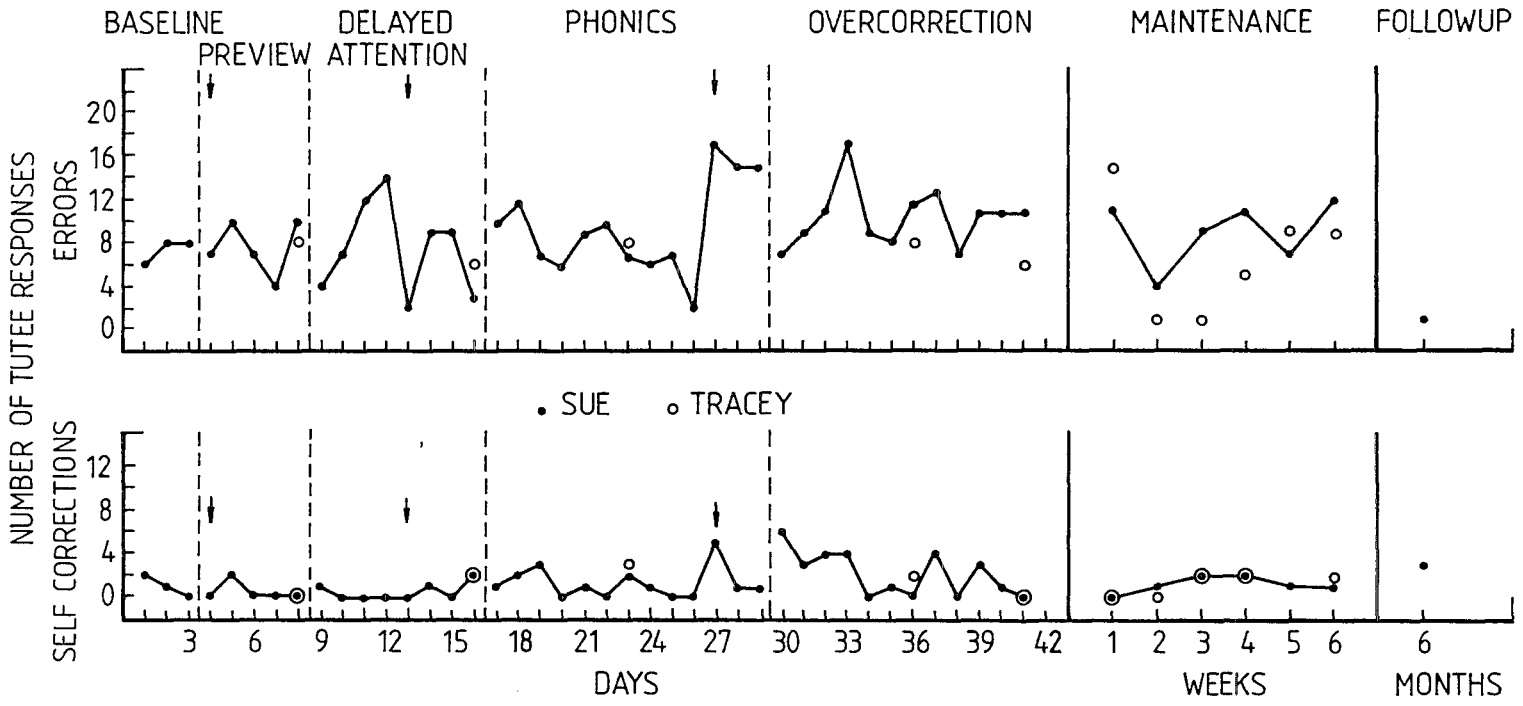
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
PETER
KAREN
DAYS
WEEKS
MONTHS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DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
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16
12
8
4
0
SUE
TRACEY
SELF CORRECTIONS
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4
0
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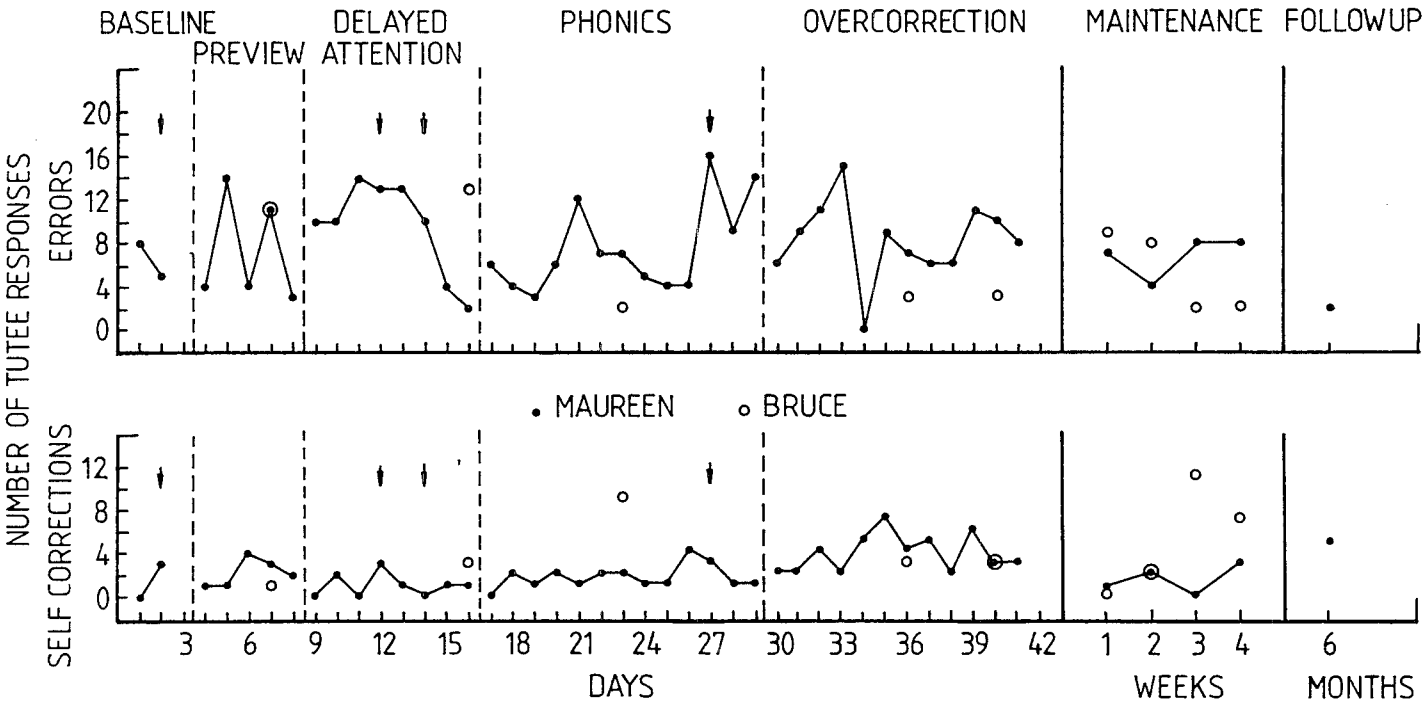
DAYS
1 2 3 4 5 6
WEEKS
6
MONTHS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PHONICS
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NUMBER OF TUTEE RESPONSES
ERRORS
20
16
12
8
4
0
MAUREEN
BRUCE
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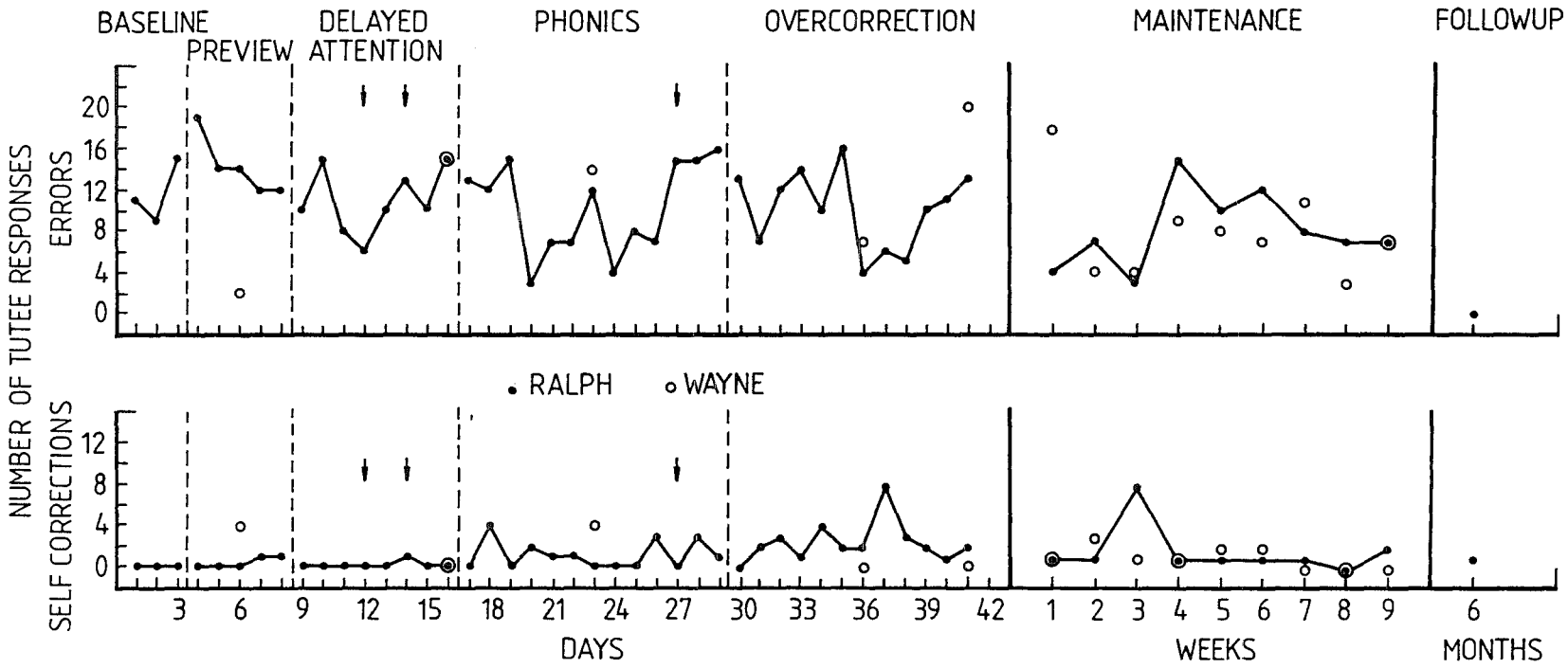
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ERRORS
SELF CORRECTIONS
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WAYNE
DAYS
WEEKS
MONTHS

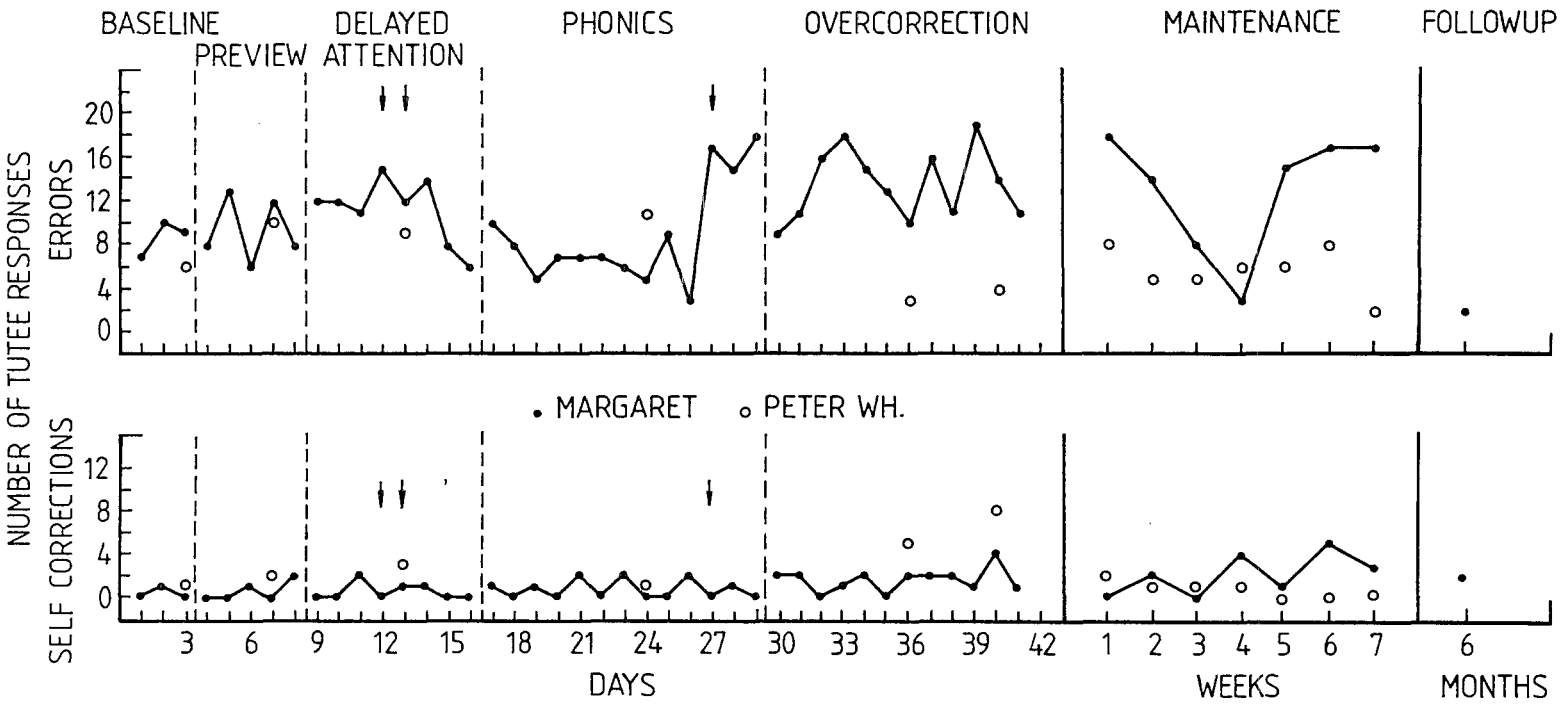

BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
20
16
12
8
4
0
MARGARET
PETER WH.
SELF CORRECTIONS
12
8
4
0
3 6 9 12 15 18 21 24 27 30 33 36 39 42
DAYS
1 2 3 4 5 6 7
WEEKS
6
MONTHS

Table 4

Mean number of tutees' errors and self-corrections

	Baseline	Preview	Delayed Attention	Phonics	Overcorrection	Follow up[a]	6 months
Errors							
Peter	15	9.6	15.3	11.8	13.3	16.1	2.0
Ralph	11.7	11.8	10.9	10.3	10.3	8.8	0.0
Maureen	4.3	7.2	9.5	7.5	8.3	6.8	2.0
Margaret	8.7	9.4	11.3	9.0	13.6	13.1	2.0
Sue	7.3	7.6	7.5	9.5	10.6	9.0	1.0
Self-corrections							
Peter	0.3	1.8	0.4	0.8	4.0	3.3	4.0
Ralph	0.0	0.3	0.1	1.2	2.5	1.8	1.0
Maureen	1.0	2.2	1.0	1.6	3.8	1.5	5.0
Margaret	0.3	0.6	0.5	0.7	1.6	2.1	4.0
Sue	1.0	0.4	0.5	1.3	2.2	1.2	3.0

[a]Data are from once weekly follow up checks, starting one week after final intervention.

Error Rates. As seen in Figure 2, error rates varied across subjects and skills. Trends can more easily be followed using Table 4. For all tutees, error rates fluctuated across skills from baseline to the final intervention and then showed a sharp decline at the six-month follow up. Peter and Maureen's error rates peaked during delayed attention, while Margaret's error rate peaked during both delayed attention and overcorrection. Sue's error rate decreased during overcorrection alone and only Ralph's error rate decreased consistently over the intervention period.

Self-Corrections. For all tutees self-corrections increased across instructional procedures when compared to baseline. Table 4 shows that the greatest changes in self-corrections occurred during overcorrection. This applied to all tutees.

DISCUSSION

Results of this study show that it is possible to train volunteers to teach independent reading skills to moderately retarded adults. Follow up checks showed not only the retention of skills by the tutors but also an overall decrease in oral reading errors and an increase in self-corrections by the tutees. The post treatment check at six months showed an even greater decrease in errors and increases in self-corrections.

Of the target skills, phonics was used least by the tutors, possibly a reflection of teaching difficulty. At times modelling by the experimenter was required to enable the tutors to apply the principles involved in teaching phonics. Other factors affecting the outcome of the study

were those not given consideration prior to its onset. Interaction between tutor and tutee was one such factor. For the most part, tutees enjoyed the sessions, however during the overcorrection intervention, Peter expressed antipathy towards both the study and the tutor. Anecdotally, tutee effort appeared contingent upon the amount of social encouragement given by the workshop supervisors. When they encouraged the tutees to attend reading, level of effort seemed to increase. On days when motivation appeared low, more effort was required from both the tutor and the experimenter. Both tutees and tutors reported dislike for overcorrection. However, it was during this intervention that the greatest changes to self-correction rates became apparent. Perhaps the aversiveness of repetition and restitution was added motivation for change.

Research using phonics would ideally involve a longer training period for the tutors before its introduction to the tutees since the phonics phase appeared the most difficult one to implement. In this study, the data do not reflect the effect of very real personality clashes that existed between Helen and Peter, with a considerable effort being required from the experimenter and the workshop supervisors to maintain tutee cooperation throughout the study. This indicates the need for prior attention to the matching of tutors and tutees with consideration given to personality factors.

STUDY 2

Parental tutoring of four reading delayed children

This study had three aims: (1) to teach four parents to tutor their children in reading using the four error correction procedures utilised in the first study; (2) to assess the efficacy of a package of four error correction procedures; and (3) to teach independent reading skills to four normal but reading delayed primary school children.

METHOD

Subjects and Setting

The subjects for this study were four parents of primary school children from three Christchurch schools. They were recruited to the study following recommendations of the head teachers of various schools. Each parent was visited by the experimenter who explained the nature and requirements of the study to them, prior to their participation.

All parents had attempted intervention to help their child to read more proficiently. One parent, Anne, was familiar with the techniques of delayed attention and phonics, through her association with Specific Learning Disabilities (SPELD). In one tutor pair the mother was replaced by the father as a tutor during the fourth and final intervention. It was found to be too stressful for the mother and daughter pair to work together.

No child received medication or had epilepsy during the course of this study. The study was conducted at the University of Canterbury, in a psychology laboratory, on Friday afternoons between 3.00 and 5.00 p.m. Each pair was

scheduled for one half hour in the laboratory and daily sessions were conducted at home. Prior to baseline measurements, each child was assessed on the Neale Analysis of Reading Ability Test (Neale, 1979). Tutor-tutee pair characteristics are summarised in Table 5.

Insert Table 5 about here

All were present for the Friday afternoon sessions for most of the training period. Each of these sessions was supervised by the experimenter. At times when attendance was not possible sessions were conducted at the subject's home ensuring minimal disruption to the programme. During the last intervention one parent (Jan) began full time employment and was unable to continue beyond the first maintenance check.

Stimulus Materials

Reading materials differed for each child. Michelle read the Dragon pirate series (McCullagh, 1964) which is graded in terms of reading age and concerns a fictional country with a fairy-like people who encounter difficulties in their every day lives. For Jason, books from the Young Shorty, More Young Shorty and Young Shorty Again (Webster, 1978) series were used. Each series comprised 12 short stories at a reading age of six to eight years. Andre used the Inner Ring Series (1972) of simple stories. These were based on the activities of a family in a small English town with a picture related to the story appearing on almost every page. For Andrew, the Ready to Read series (1963) was used. This consists of basic stories graded with respect to reading age and includes supplementary readers from each

Table 5

Summary of Subject Characteristics

Tutor	Age	Tutee	Age	Reading Age[a]
Robyn	33 yrs	Jason	7 yrs 10 mths	6 yrs 6 mths
Jan	35 yrs	Andrew	6 yrs 1 mth	No score
Anne	36 yrs	André	8 yrs 3 mths	7 yrs 6 mths
Val	37 yrs	Michelle	8 yrs 6 mths	7 yrs
Ian	41 yrs			

[a]data from Neale Analysis of Reading Ability (1979)

level. No child was familiar with the reading material prior to this study.

The reading levels for each child was determined in the same manner as in the first study, using a similar method to that suggested by Glynn et al. (1979). In this study, as in the first, each child was required to read five 50-word passages and an overall total of errors was taken. This was then averaged to find the mean error rate.

Training passages were all 100 words in length and subjects were allocated one half-hour to complete the session. Four undergraduate students for whom this study served as the practical component for a paper in behavioural modification served as trainers. Training was given following a discussion of definitions. Baseline sessions were scored with an agreement rate of 85-100% required before training of the subjects commenced.

Response Definitions

Measures were taken of both tutee and tutor responses, as described in the first study. Errors and self-corrections, as defined in the previous study, were scored. Of tutor behaviour the four target behaviours described previously were measured: preview, delayed attention to error, phonics and overcorrection.

Data Collection and Reliability

All baseline and training sessions were recorded on audio tapes for later analysis and reliability checking. One session per week was video taped and all responses were recorded on a response analysis sheet (Appendix A). The experimenter served as a reliability rater and scored 25% of all sessions for each subject. Random sessions were

scored and agreement was computed using Kazdin's (1983) word-by-word analysis method, in which the number of agreements between the raters is divided by the number of agreements plus disagreements, with the resulting quotient multiplied by 100 to give a percentage reliability. For Val and Ian average interobserver reliability was 97% with a range of 83%-100%. For Anne average reliability was 98%. For Robyn reliability ranged between 95-100% with a mean of 97%. For Jan reliability averaged at 99% with a range of 94%-100%. The reliability of the independent variable was 100%.

Experimental Design

A multiple baseline across skills design (Baer, Wolf, & Risley, 1968) was used. This allowed evaluation of all four parents across the four skills which were added sequentially to the training programme. These are detailed in the first study.

Procedure

This was similar to the first study. Prior to the introduction of new skills the experimenter explained to the parent the procedure involved before the child read. Written instructions were also given to the parent to be used as a guide at home.

This study consisted of the following components.

Baseline. For Val, Ann and Robyn baseline lasted for five sessions. For Jan baseline lasted for three sessions.

Intervention was as in the first study: preview, delayed attention to errors, phonics and overcorrection. Following the introduction of a new skill the parents were given audio tapes to record all intervening sessions at home

until the following week and written instructions (Appendix B). The tape was then scored by the trainers for use of target skills. New skills were introduced on alternate weeks. All skills were introduced by the parent in the same manner as was used in the first study.

Preview lasted for 11 sessions for Jan, 12 sessions for Anne and Val, and 18 sessions for Robyn.

Delayed Attention lasted for 12 sessions for Val, Robyn and Anne, and 11 sessions for Jan.

Phonics lasted for 11 sessions for Jan, 12 for Robyn, 10 for Anne, and 12 for Ian who replaced Val at this point.

Correction lasted for 17 sessions for Ian, 11 sessions for Jan, 13 for Anne, and 12 for Robyn.

Follow up began one week following the end of the training programme. The parent was instructed to bring a sibling or close friend of the child to work with, but no work was set for the probe pair to do during the week. At the laboratory the parent was asked to read with both children, one at a time, but no prompting was given as to the use of the target skills.

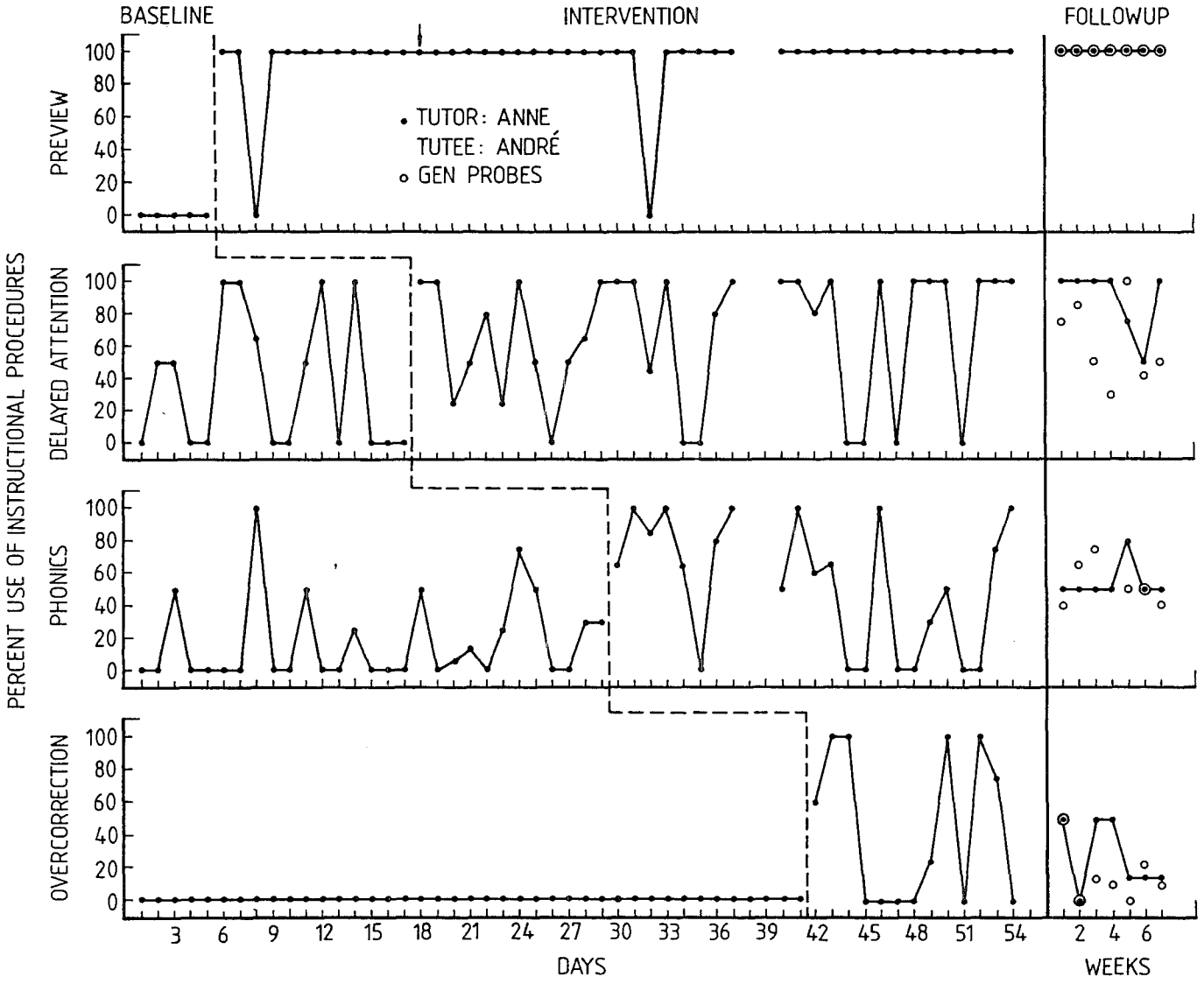
RESULTS

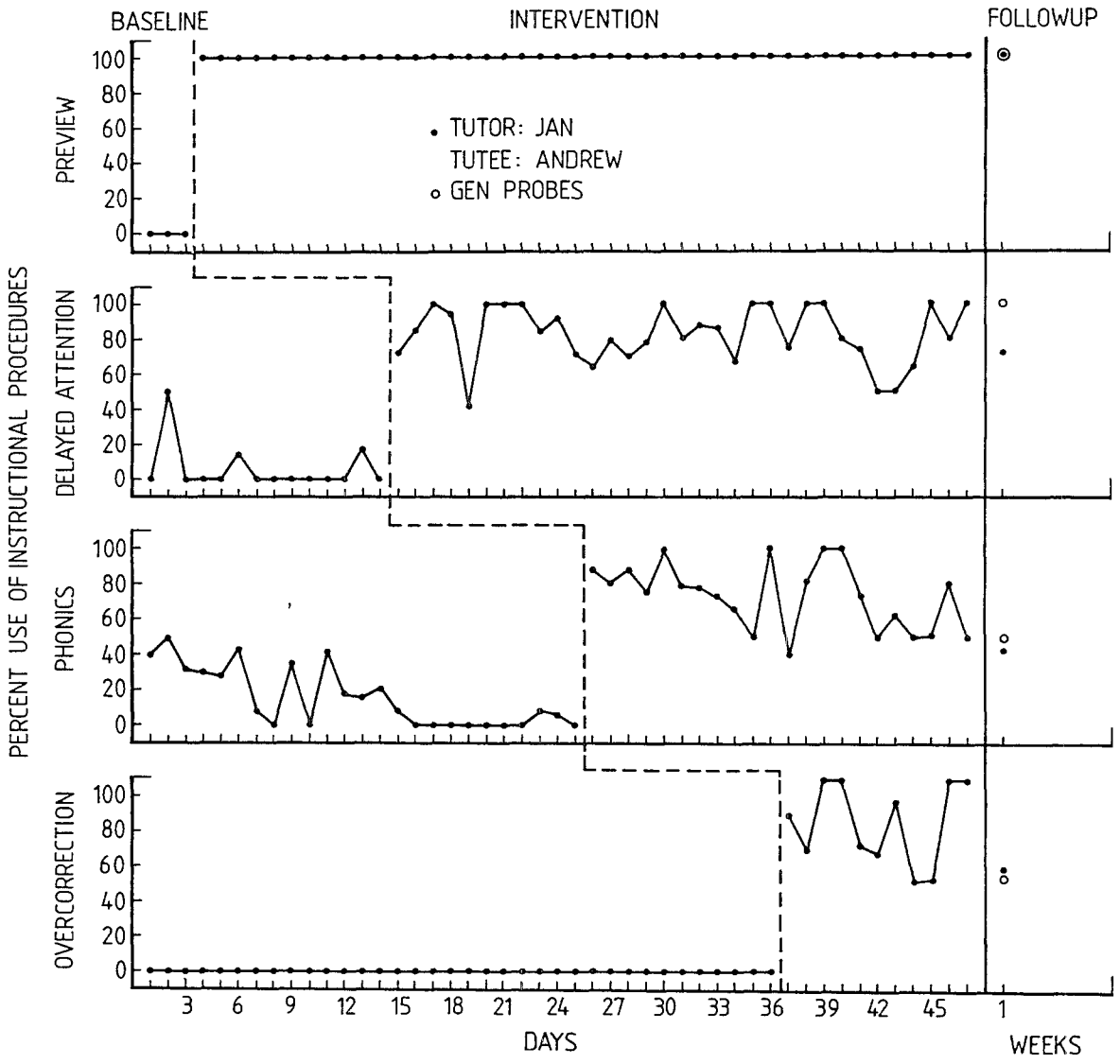
Tutor Responses Across Skills

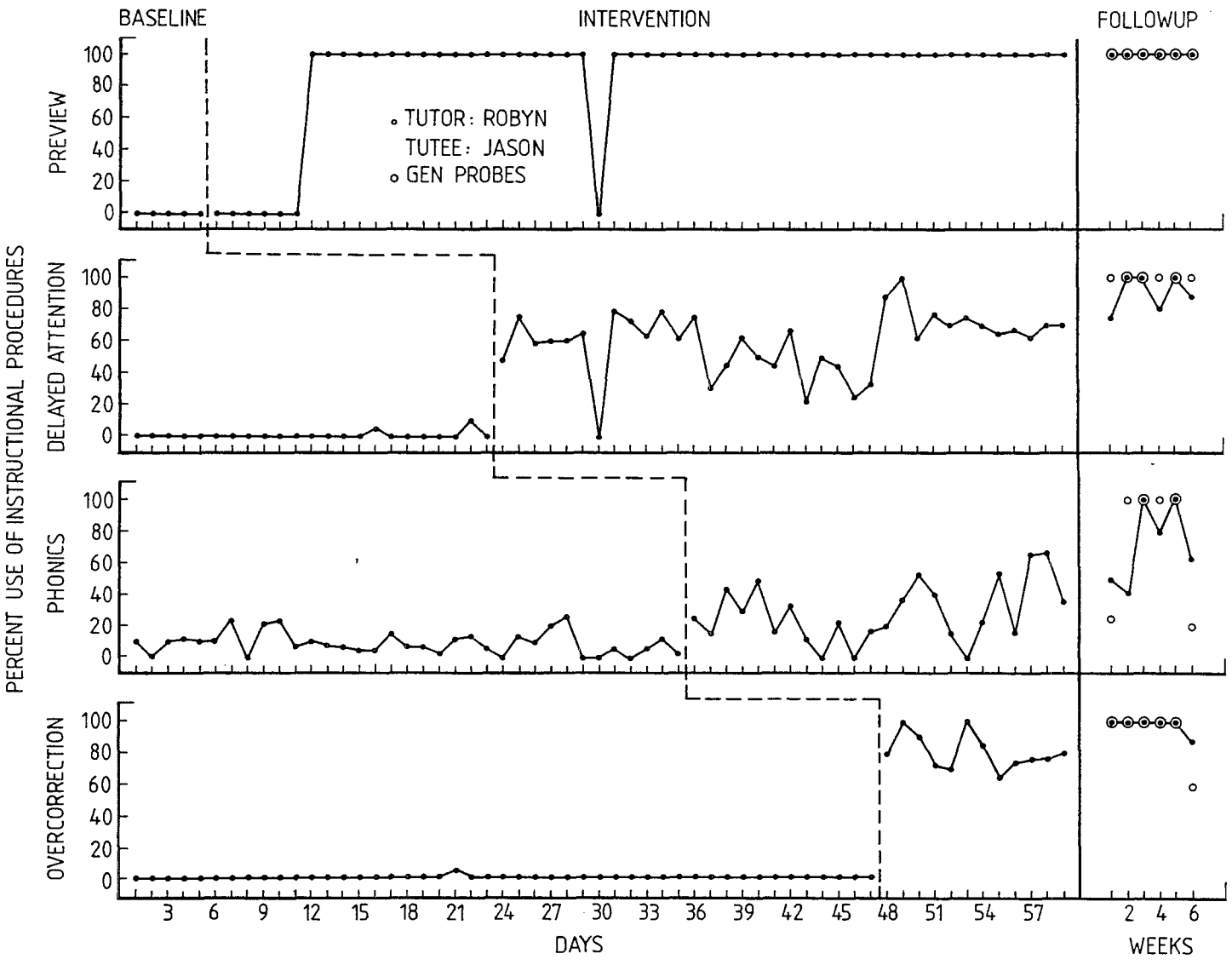
Tutor responses are summarised and presented in detail in Figure 3, while Table 6 shows mean percentage use of the skills by the tutor.

Insert Figure 3 and Table 6 about here

Figure 3. Percentage correct use of target skills by parent tutors. Arrows indicate changes in tutees' reading levels. Gaps indicate days missed.


BASELINE
INTERVENTION
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
• TUTOR: ANNE
TUTEE: ANDRÉ
o GEN PROBES
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54
DAYS
2 4 6
WEEKS


BASELINE
INTERVENTION
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
• TUTOR: JAN
TUTEE: ANDREW
o GEN PROBES
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 1
DAYS
WEEKS


BASELINE
INTERVENTION
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: ROBYN
TUTEE: JASON
GEN PROBES
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57
DAYS
2 4 6
WEEKS

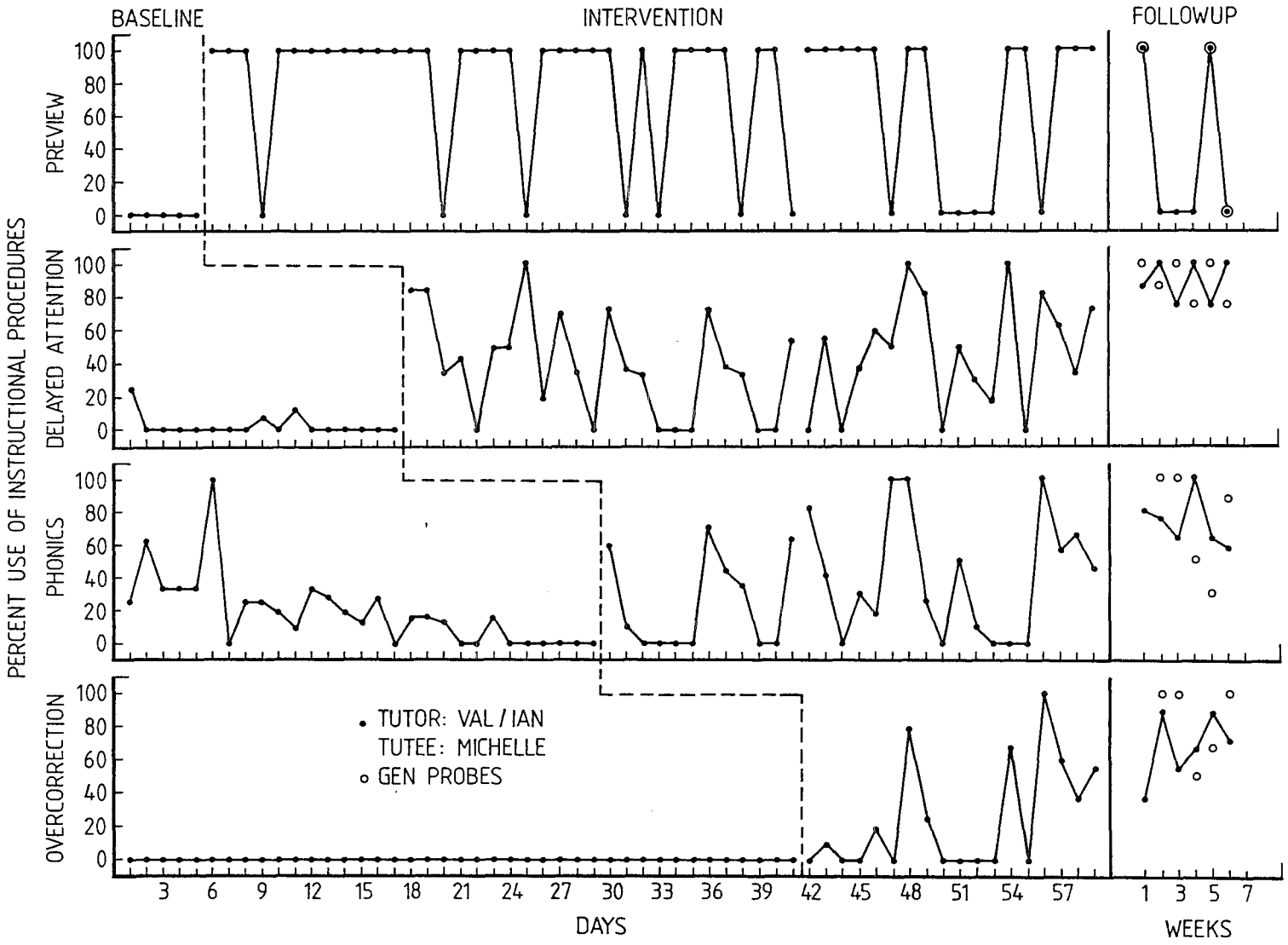

BASELINE
INTERVENTION
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
• TUTOR: VAL / IAN
TUTEE: MICHELLE
o GEN PROBES
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57
DAYS
1 3 5 7
WEEKS

Table 6

Mean percent use of instructional procedures

Parent	Preview			Delayed Attention			Phonics			Overcorrection		
	B	T	F	B	T	F	B	T	F	B	T	F
Anne	0.0	91.8	100.0	30.9	63.5	89.2	17.4	49.0	54.3	1.2	43.1	27.9
Jan	0.0	100.0	100.0	5.9	82.6	72.0	15.2	73.4	43.0	0.0	81.5	60.0
Robyn	0.0	87.0	100.0	0.7	59.9	90.0	9.3	29.5	72.5	0.1	74.8	98.0
Val	0.0	80.5	-	2.8	40.1	-	18.7	25.6	-	-	-	-
Ian	-	66.6	33.3	-	49.1	89.0	-	40.6	72.8	0.0	20.1	67.8
Means	0.0	85.2	83.3	10.1	59.1	85.1	15.2	43.6	60.5	0.3	54.9	64.3

B - Baseline

T = Training

F = Follow up, initiated one week after final intervention

Preview. None of the subjects used preview prior to the training of the skill. Following introduction, only Jan used it with 100% frequency. Robyn and Anne used the skill for all but one session and use by Val varied. During follow up the use of the skill was maintained at intervention level.

Delayed Attention. All subjects made some use of the skill during baseline, with Anne using it most. Following training Val used it least, while Jan used it most of all.

Phonics. All parents used the skill during baseline. Both Anne and Val used the skill when errors were attended to. Training increased the use of the skill by parents.

Overcorrection. Both Anne and Robyn made slight use of overcorrection during baseline. Following training use of the skill fluctuated for all, but was used most by Robyn and Jan.

Follow up. Responses tended to vary. Ian (Val), Anne and Robyn's responses increased while Jan's scores decreased.

Tutee Responses: Error Rates

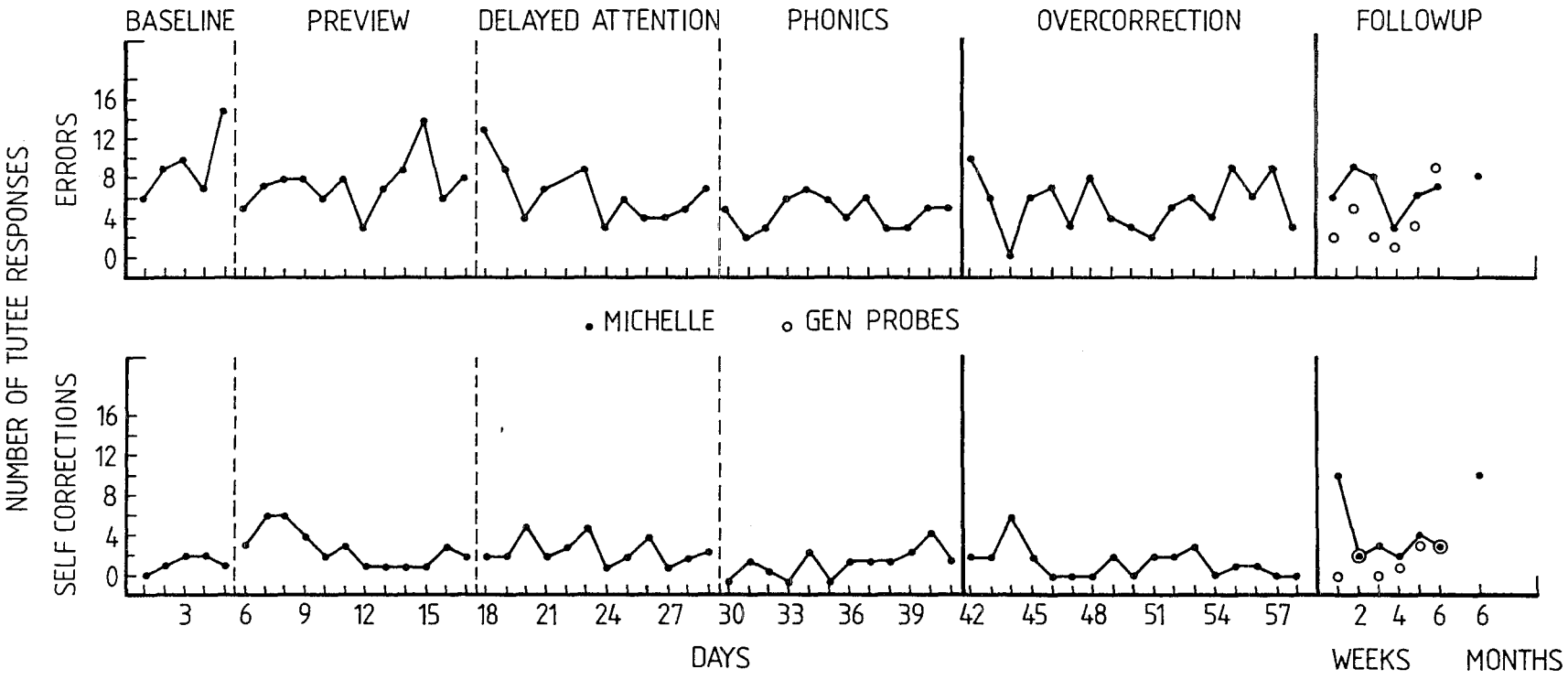
Details of both error and self-correction rates are summarised in Figure 4 and Table 7. Data for Andrew were lost and therefore not included in this section.

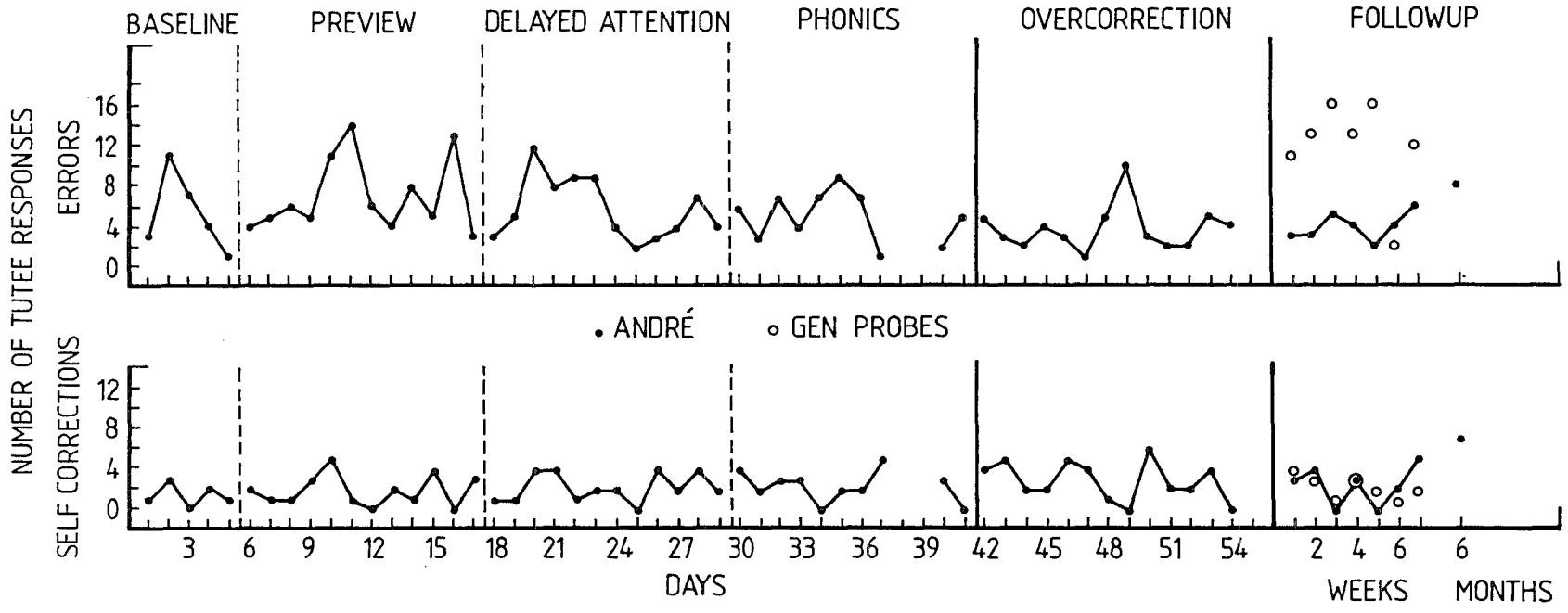
Insert Figure 4 and Table 7 about here

Errors

Michelle did not change reading levels during the course of the study and her error rates varied. From Table 7, errors are seen to decrease consistently from preview through phonics, after which there is a trend to increase from overcorrection through follow up. The lowest error

Figure 4. Tutees' errors and self-corrections per 100 words. Arrows indicate changes in reading levels. Gaps indicate days missed.


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
16
12
8
4
0
• MICHELLE
o GEN PROBES
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57
2 4 6 6
DAYS
WEEKS
MONTHS


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
16
12
8
4
0
• ANDRÉ
o GEN PROBES
SELF CORRECTIONS
12
8
4
0
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54
DAYS
2 4 6
WEEKS
6
MONTHS

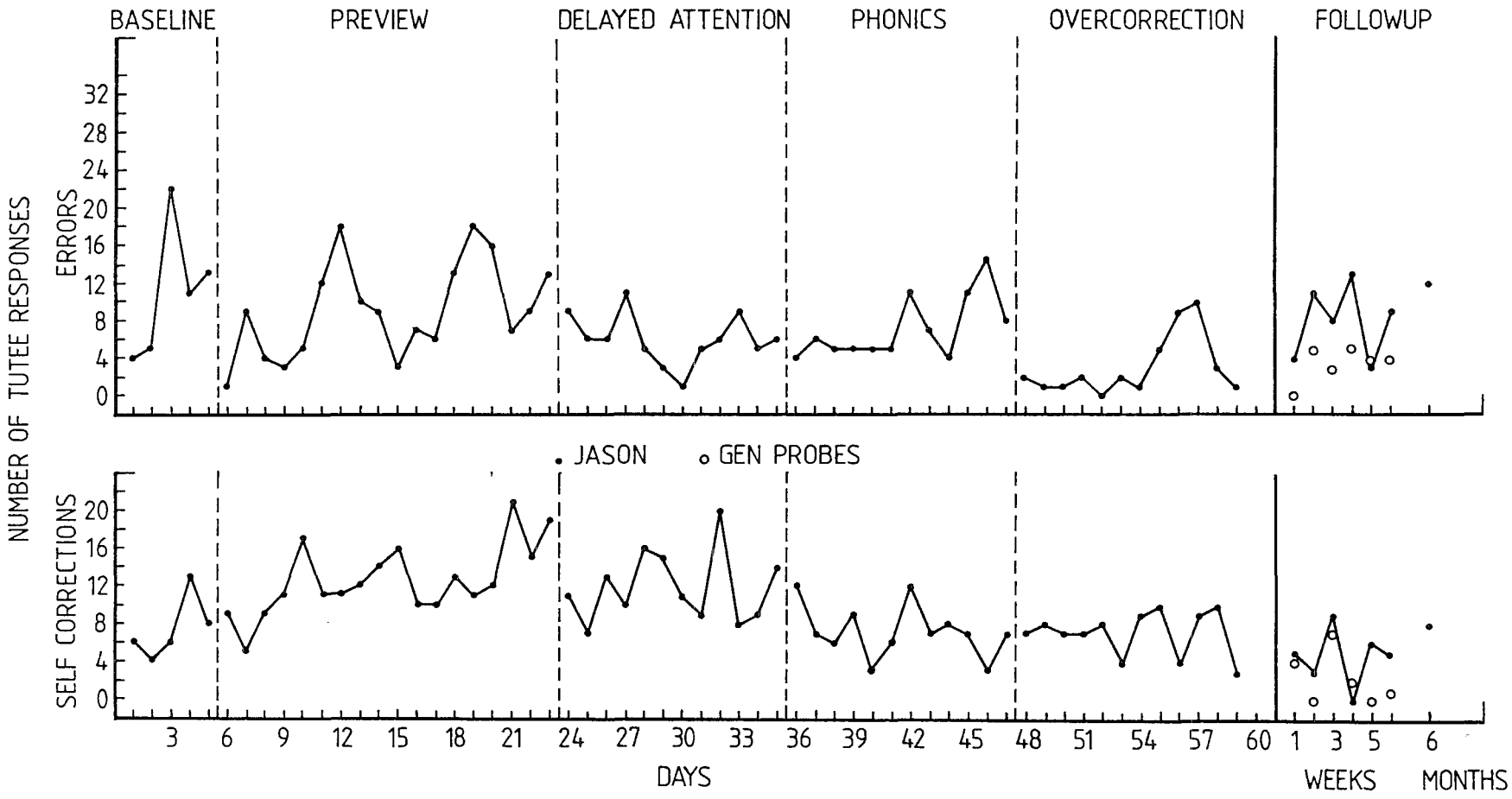

BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
JASON
GEN PROBES
DAYS
WEEKS
MONTHS

Table 7

Mean Number of Tutees' Errors and Self-Corrections

	Baseline	Preview	Delayed Attention	Phonics	Overcorrection	Follow up[a]	6 months
Errors							
Michelle	9.4	7.4	6.6	4.6	5.4	6.5	8.0
Andre	5.2	7.0	5.8	5.1	3.8	3.9	8.0
Jason	11.0	8.9	6.0	7.2	3.1	8.0	12.0
Self-Corrections							
Michelle	1.2	2.8	2.7	1.8	1.4	4.0	10.0
Andre	1.4	1.9	2.3	2.4	2.8	2.4	7.0
Jason	7.4	12.6	11.9	7.3	7.2	4.7	8.0

[a]Data are from follow up at weekly intervals, starting one week after final intervention

score of 3.8 was obtained during overcorrection, and the highest was 7.0, obtained during preview. Jason's errors decreased markedly from preview through overcorrection from 11.0 to 3.1, but increased during the follow up checks to a point just higher than baseline.

Self-Corrections

Michelle's self-corrections fluctuated slightly with an increase from baseline during preview and delayed attention, dropping during phonics and overcorrection and significantly increasing during the follow up checks. Andre's scores show a consistent increase from baseline through to the final check, with only one small drop during the first follow up check. Jason's scores varied, peaking in the first two conditions, then decreasing during phonics through to the first follow up check. At the final follow up check, his score was again higher than the baseline self-correction score.

DISCUSSION

With attention to tutor responses, there are some wide variations in frequency of target response. Val fluctuated in her use of all skills and reported that she found the programme difficult to use at home with Michelle. Ian also found the programme difficult to follow but did report that he had enjoyed the time he was able to spend alone with Michelle. In addition, Michelle's brother Richard began to read more to himself during the time Michelle's reading programme was scheduled. Timing of the reading sessions may well have influenced the results also. Home sessions were invariably conducted during the evenings, and late Friday afternoons are less than ideal times to work with the

children. For all parents there was an increase in the use of target skills from baseline through to follow up, and for all children there was a decrease in the number of errors with a corresponding increase in the number of self-corrections. All parents reported their children to be more confident in their reading, and to be reading more than at the start of the programme.

STUDY 3

Pyramidal peer tutoring of reading by moderately mentally retarded adults

This study had three aims: (1) to train moderately mentally retarded adults to tutor their mentally retarded peers; (2) to show that the need for professional input of reading specialists may be reduced by the training of peer tutors; and (3) to provide a package of behavioural skills to help mild and moderately retarded adults to improve their reading skills.

METHOD

Subjects and Setting

Seven mentally retarded adults served as subjects for this study. They were mild to moderately retarded according to the AAMD criteria (Grossman, 1983). In addition to the seven subjects, two other retarded adults served as tutees at random points throughout the study, to probe for the generalised use of tutoring skills. Details of tutor-tutee characteristics are presented in Table 8.

Insert Table 8 about here

Reading age equivalence was assessed on the Neale Analysis of Reading Ability (Neale, 1979). All participants worked at an IHC Vocational Resource Centre in Christchurch. John tutored Mark and Wayne; Mark tutored Denise and Maree; and Wayne tutored Peter and Brendon. John received 50 mg/night of Melleril consistently throughout the study, for behavioural disturbance. No other tutees received medication or had epilepsy. John was prone to mood changes during

Table 8

Description of Subject Characteristics

Subject	Age (yrs)	Full-scale I.Q. (WAIS)	Degree of Retardation (AAMD criteria)[a]
John	40	67	moderate
Mark	28	66	mild
Denise	19	54	moderate
Maree	28	49	moderate
Wayne	23	60	moderate
Brendon	35	47	moderate
Peter E.	22	65	mild
Maureen[b]	38	53	moderate
Peter Wh.[b]	25	49	moderate

[a]Grossman (1983)

[b]Subjects used for generalisation probes

which time he became abusive and refused to participate. These changes would disrupt the reading for that day. Wayne was the pacifier of the group and attempted to quieten John while calming the other tutees. He was also an able translator for Brendon who underwent a cleft palate repair just prior to the start of the study. His speech was clear initially due to pharangeal swelling, but deteriorated as the swelling subsided. Brendon often relied on Wayne to translate for him in communication situations, and was able to do so during the reading sessions.

Informed consent was obtained from the study participants, their families, and the protocol of the study was approved by the administration of the Society for the Intellectually Handicapped. The experimenter was a graduate student in psychology. She was present for three mornings a week throughout the study.

Reading sessions were conducted four mornings a week between 9-12 midday in a 3m x 6m room containing paper files, a bookcase, a table, and five chairs, two of which were arranged at the table.

Stimulus Materials

Reading materials used for this study differed for the trainees. John and Mark's reading was taken from the book 'Knock Down' by Dick Francis (1974), a series written for adult interest at a reading age of 9 to 12 years. Wayne's material was taken from the Trend Approach Series (Falk & Bird, 1975), which is a series with an interest level for adolescents and young adults but graded in terms of reading age for delayed readers. Denise and Brendon's reading material was taken from the Young Shorty, More Young

Shorty and Young Shorty Again series of books by James Webster (1978). Each of these series consists of 12 short stories designed for a reading age of six to eight years. Maree's reading material initially comprised books from the Trug Series for beginning readers (Flowerdew, 1973), about a young boy and his family during the time of cavemen, and Peter E's reading material was taken from the Pedro the Donkey series (Flowerdew, 1973). This series contained seven short stories about a donkey, Pedro, and the family he lived with. It was written for the reader of 5-6 years.

The reading level was chosen using a modification of the Glynn et al. (1979) method of determining the correct reading level, as with the earlier studies. The trainees were asked to read five 50-word passages with between 20% to 80% accuracy. Less than 20% accuracy meant that the material was too difficult, while more than 80% accuracy meant the material was too easy.

Response Definitions

Response measures were taken for both tutor and tutee behaviour, in an identical manner to the first study.

Experimenter behaviour was also measured. When the tutor did not attend to an error, for example, the experimenter would prompt him by calling his name. Prompting might also be given non-verbally. For example, if during delayed attention intervention a tutor was about to respond to an error immediately, the experimenter would place a hand on the shoulder to restrain the tutor from immediate attention to error.

Data Collection

The experimenter was present for all reading sessions

which took place two to four mornings per week. All training sessions were scheduled between 9.00 a.m. and midday. As with studies one and two, each reading session was recorded on audio tape and one session per week was video taped to assess the reliability of the independent variable. Again, each session was recorded on a score sheet (Appendix A).

Reliability

As in the previous studies, prior to reliability rating, an independent observer was trained to check the tapes. First a random selection of 25% of all audio and video tapes was made by the observer. Using baseline tapes that were not included in the designated random sample, the observer was trained to score the responses of tutor, tutee, and experimenter. When interobserver agreement was higher than 85% for more than five consecutive reading sessions the reliability checks were instituted. Inter-rater agreement was calculated using Kazdin's word-by-word agreement method (Kazdin, 1982). This was computed by dividing the number of inter-rater agreements by agreements plus disagreements, the result of this quotient was then multiplied by 100 to give a percentage reliability. The mean percentage was 96% with a range of 84 to 100%. Reliability checks were made outside intervention sessions enabling the observer to replay relevant sections as desired. The reliability of the independent variable was 100%.

Experimental Design

As in the earlier studies a multiple baseline across skills design (Baer, Wolf, & Risley, 1968) was used, allowing

evaluation of the tutors across the four skills which were added sequentially to the training programme.

Procedure

Training of tutors. As John was the primary tutor, he was the first subject to come for the reading session. Before either Mark or Wayne were asked to come to read with John, the experimenter would explain what was required during that day's reading session. Where appropriate the experimenter would role play the teaching strategy in order to clarify the instructions, i.e., John would act as the tutee with the experimenter acting as the tutor.

Written instructions were also prepared for each subject prior to the introduction of a new intervention, however, it was found that these were inappropriate and that role modelling was more useful. Roles would then be swapped so John could act as tutor before he took Mark or Wayne for reading. The same procedure would occur before Mark and Wayne read with each of their tutees. At random points throughout the study Maureen and Peter Wh. were asked to read with the tutors to assess generalisation of teaching skills. In this study, the experimenter reminded the tutors of the techniques to be used with each probe, just as if it were another training session.

The study comprised the following components:

Baseline. Baseline data were collected for three consecutive sessions. The tutor was instructed to do whatever he thought best to help the tutee read. No attempt was made by the experimenter to intervene or assist the tutor.

Intervention. All interventions were introduced in a manner identical to that of the first two studies.

Preview. Before the tutee was asked to read, the tutor was required to preview the story. As in the Wong and McNaughton (1980) and Singh and Singh (1984, 1986) studies, the tutor provided a background to the story, and both tutor and tutee discussed the story before it was read. The title was included as a cue and any new words, phrases and expressions were introduced orally, without being visually identified in the text. Meanings of new words in the target were discussed and tutees' questions about the text were answered. The tutee then read the target text. This condition was in effect for seven sessions.

Delayed attention required the tutor to wait until the end of the sentence before attending to the tutee's error (McNaughton & Glynn, 1981; Singh et al., 1985). If the tutee paused after making an error, delayed attention was provided 10 seconds later and the correct word was supplied. This condition was in effect for 10 sessions.

Phonics required the tutor to help the tutee to sound the error word out, stressing the initial sound, medial vowels, sound blends and final sounds (Lovitt & Hansen, 1974). This condition was in effect for eight sessions.

Overcorrection involved delaying attention to the error, applying the phonics procedure to correct it, then asking the tutee to repeat the word five times. The tutee was then required to repeat the sentence in which the word appeared (Singh et al., 1984; Singh & Singh, 1986).

Maintenance. Two weeks after the conclusion of the last intervention, maintenance checks commenced, during

which period treatment conditions were in effect. Observations were made of all subjects once weekly, for a period of four weeks.

Follow up. A final post-treatment check was made six months later of tutee reading skills for which the tutees were asked to read a passage of 100 words which was set at their initial reading levels.

Generalisation probes were taken randomly throughout the study. Two other trainees were assigned to the tutors for reading. The tutors were reminded of the skills to be used.

RESULTS

Tutor Responses

As shown in Figure 5, the percentage use of correct tutoring skills varied between tutors. In general, the tutors can be seen to have used the training skills with differing consistency; however, by the last session of the final intervention all tutors had achieved 100% correct use for some part of the intervention period, with most gaining over 60% accuracy.

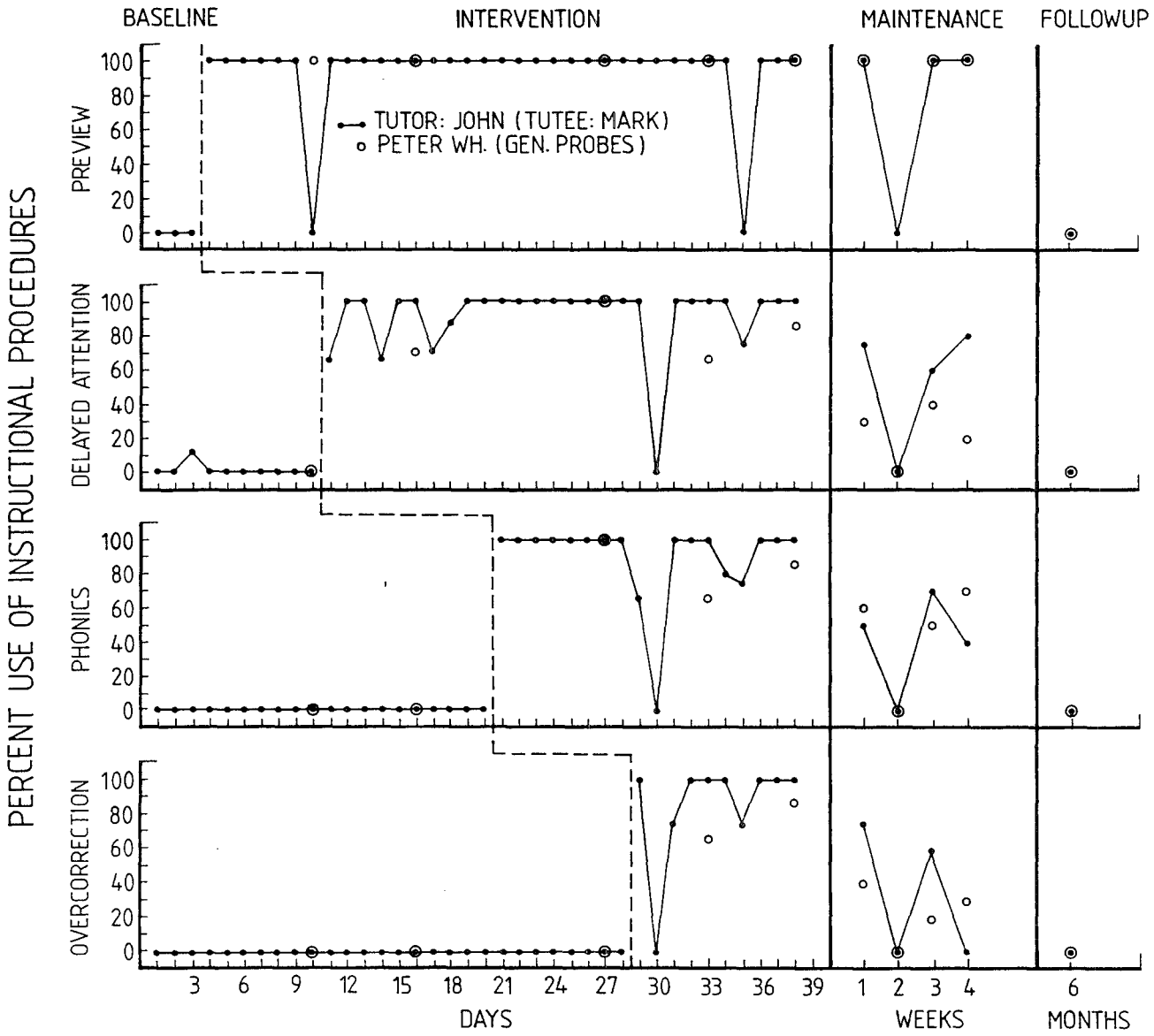
Insert Figure 5 and Table 9 about here

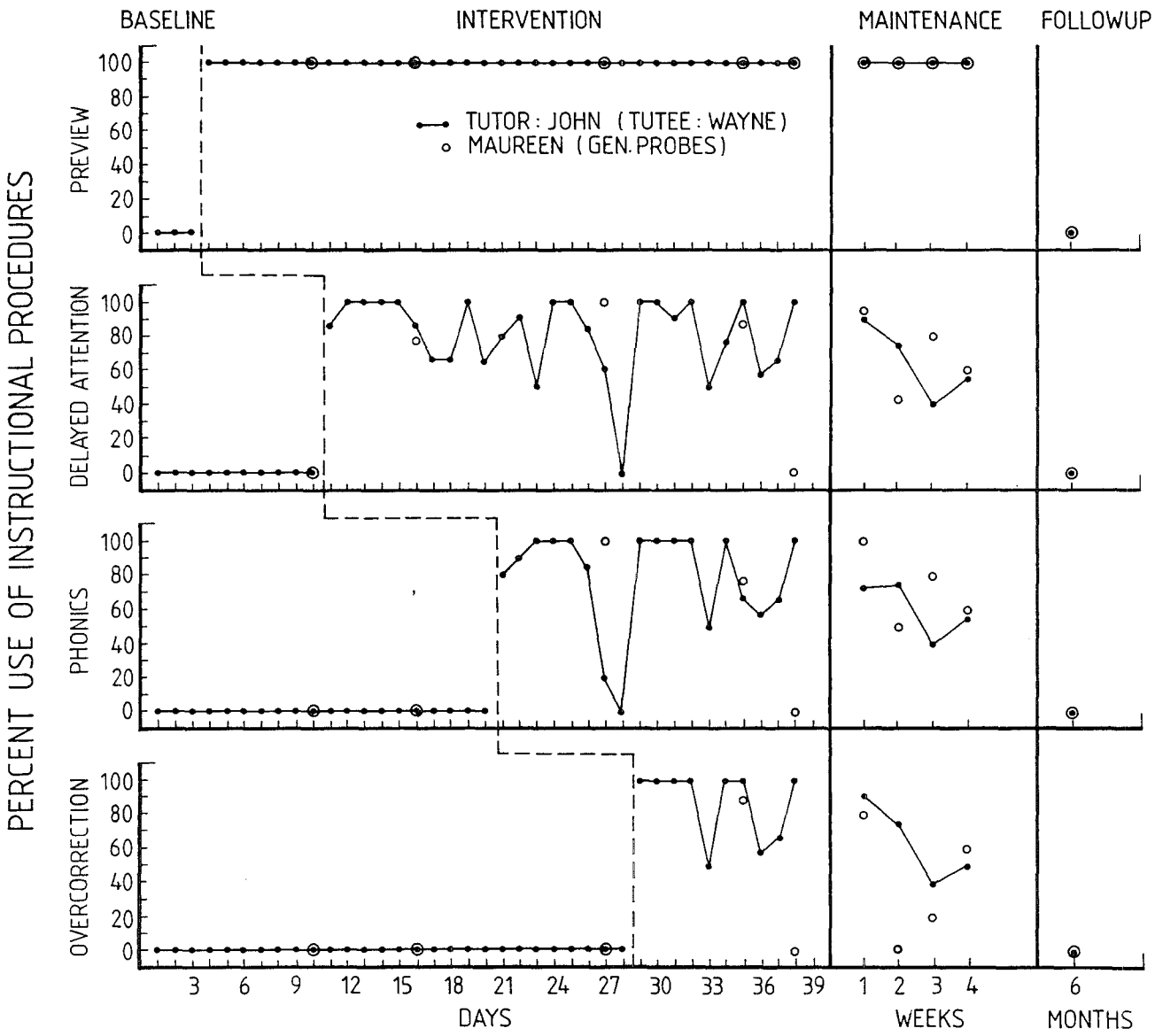
Follow up observations indicated an overall decline in percentage use of skills, with only Mark retaining 100% accuracy with one of his tutees. The trend was for John and Wayne to score at 0% with one of their tutees, but to perform consistently more on target with the other tutee.

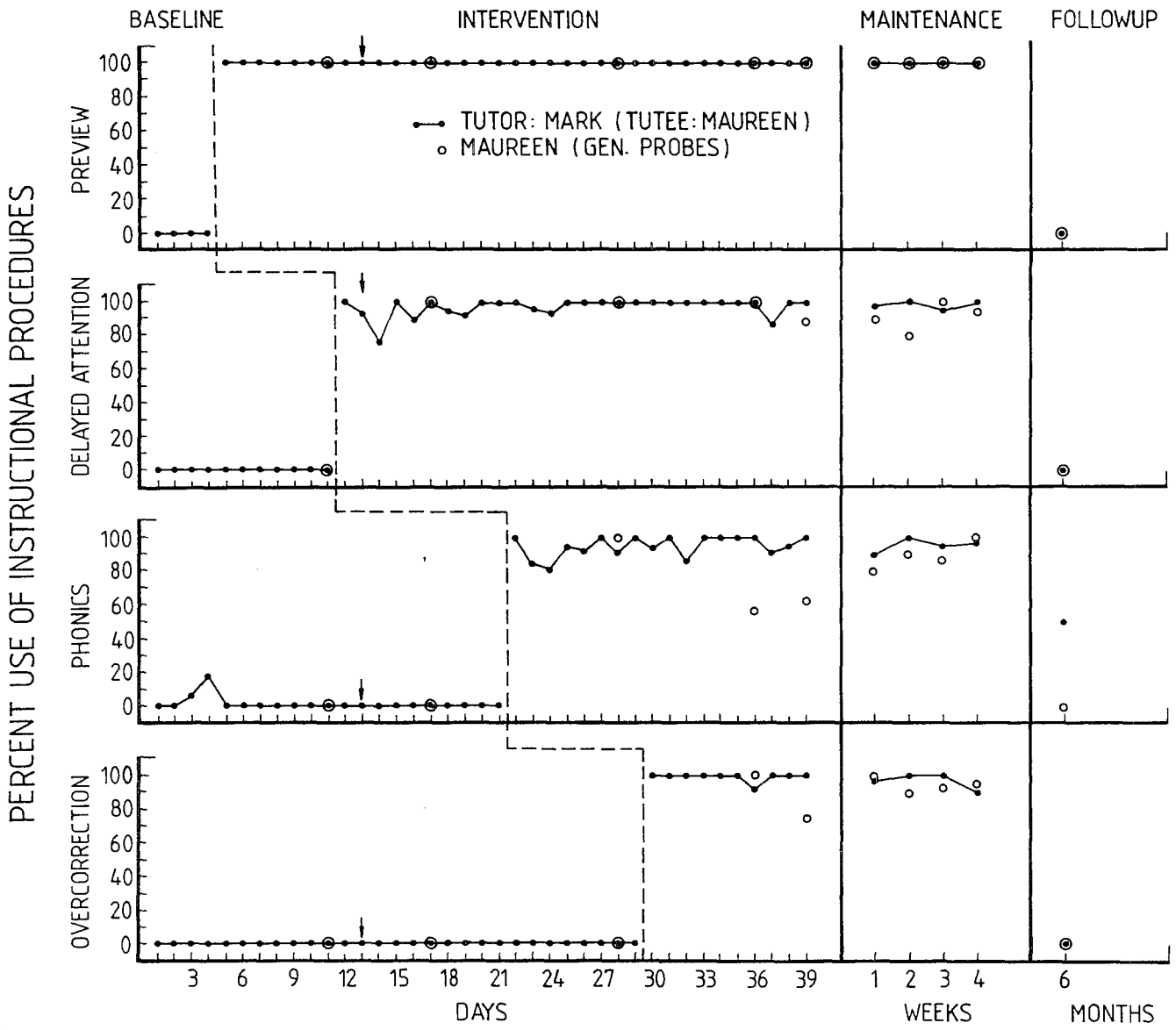
Tutor Responses Across Skills

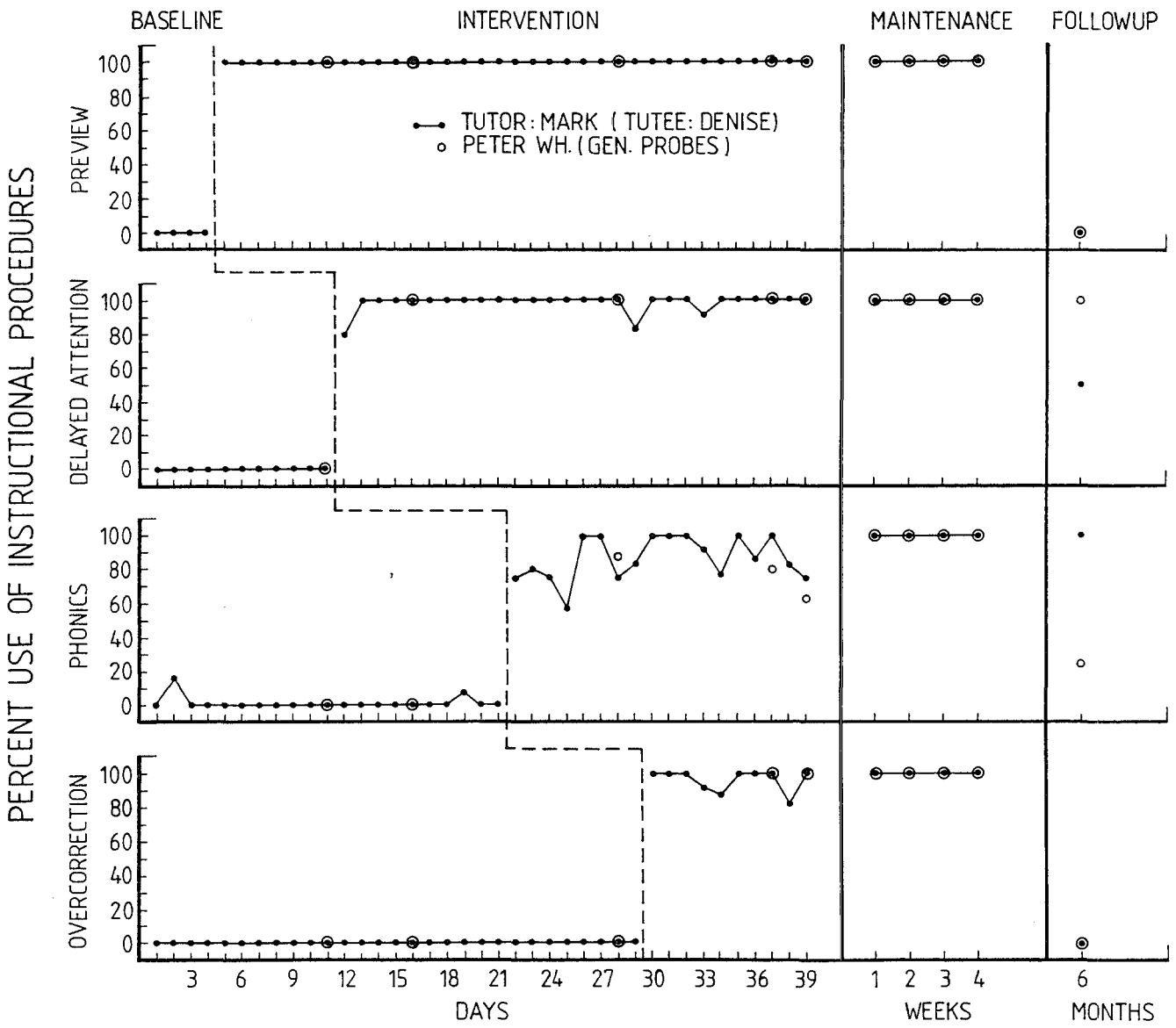
Preview. This was not used by any tutor prior to its introduction. Following training, Mark used the skill

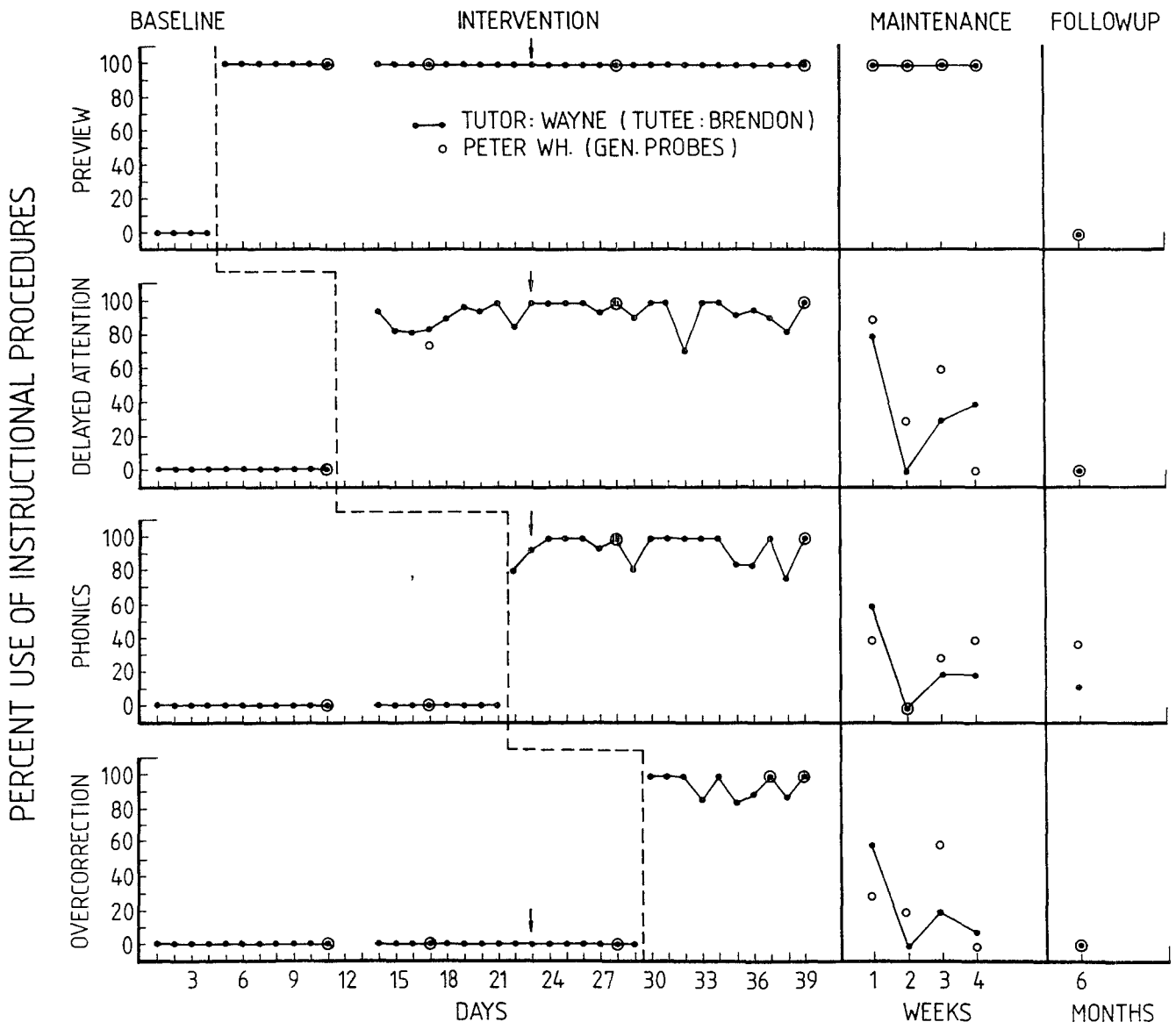
Figure 5. Percentage correct use of training skills by moderately retarded adult tutors. Arrows indicate changes in tutees' reading levels. Gaps indicate days missed.


BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: JOHN (TUTEE: MARK)
PETER WH. (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS


BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR : JOHN (TUTEE : WAYNE)
MAUREEN (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS


BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: MARK (TUTEE: MAUREEN)
MAUREEN (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS


BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: MARK (TUTEE: DENISE)
PETER WH. (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS


BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: WAYNE (TUTEE: BRENDON)
PETER WH. (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS

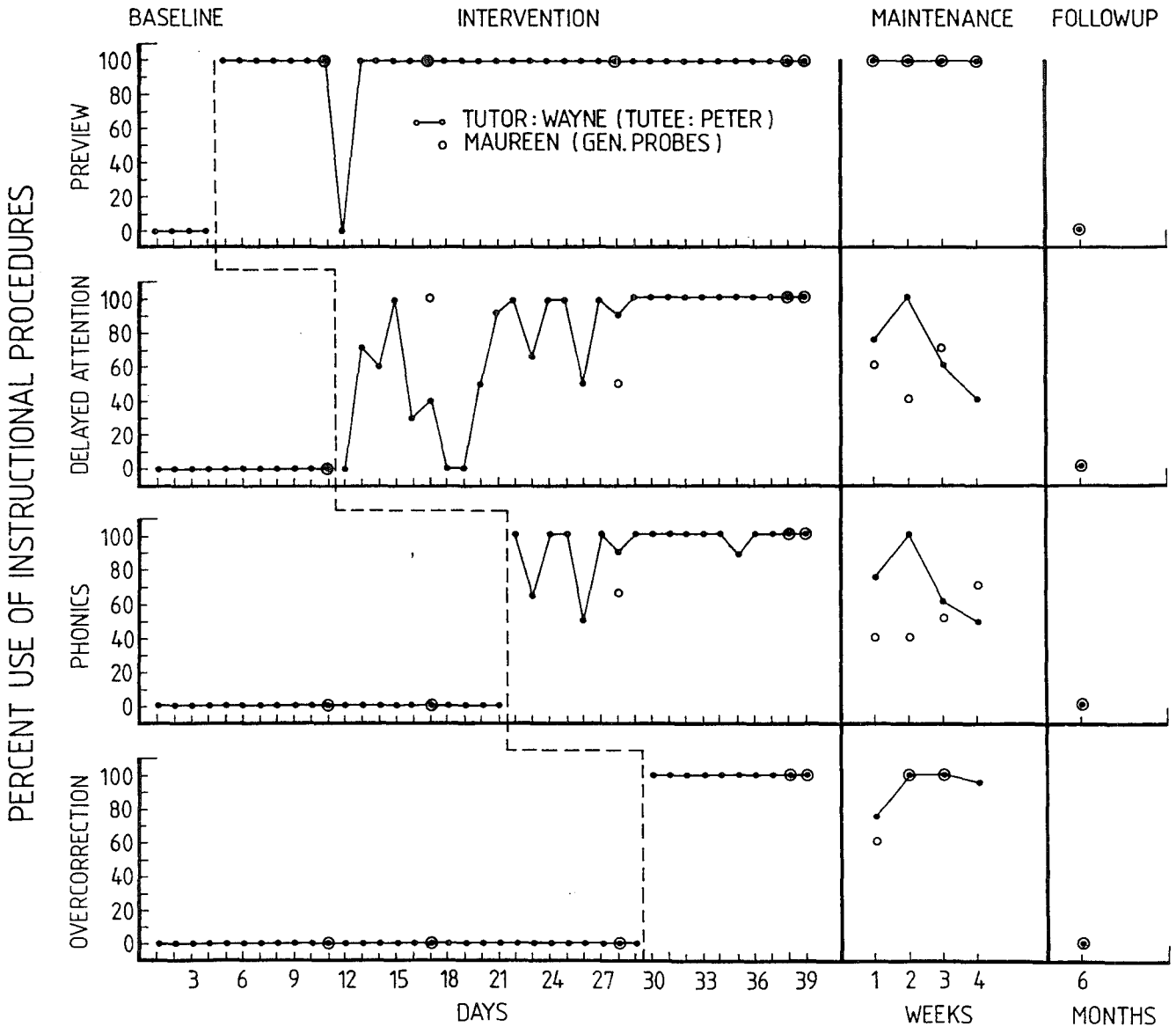

BASELINE
INTERVENTION
MAINTENANCE
FOLLOWUP
PERCENT USE OF INSTRUCTIONAL PROCEDURES
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
100
80
60
40
20
0
TUTOR: WAYNE (TUTEE: PETER)
MAUREEN (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39
DAYS
1 2 3 4
WEEKS
6
MONTHS

Table 9

Mean Percentage Use of Instructional Procedures by Tutors

	Preview				Delayed Attention				Phonics				Overcorrection			
Tutor-Tutee	B	T	M	F[a]	B	T	M	F[a]	B	T	M	F[a]	B	T	M	F[a]
John & Mark	0.0	89.2	75.0	0.0	1.1	88.0	53.6	0.0	0.0	83.8	65.0	0.0	0.0	85.0	33.8	0.0
John & Wayne	0.0	97.3	100.0	0.0	0.0	83.0	65.0	0.0	0.0	79.0	60.8	0.0	0.0	87.3	64.0	0.0
Mark & Maree	0.0	100.0	100.0	0.0	0.0	97.4	98.0	0.0	0.8	94.8	95.5	50.0	0.0	99.2	96.3	0.0
Mark & Denise	0.0	100.0	100.0	0.0	0.0	98.5	100.0	50.0	1.1	87.9	100.0	100.0	0.0	96.9	100.0	100.0
Wayne & Brendon	0.0	100.0	100.0	0.0	0.0	91.4	62.5	0.0	0.0	84.5	22.3	13.0	0.0	94.8	22.5	0.0
Wayne & Peter E.	0.0	97.3	100.0	0.0	0.0	77.5	66.8	0.0	0.0	93.5	66.8	0.0	0.0	100.0	100.0	0.0
Means	0.0	97.3	95.8	0.0	0.2	89.3	74.3	8.3	0.3	87.2	68.4	27.2	0.0	93.9	69.4	16.67

B = Baseline

T = Training

M = Maintenance

F = Follow up

[a]Data are from one 6-month follow up

consistently during intervention and follow up; Wayne failed to use it on one occasion with one tutee, but had 100% use during follow up with both tutees. John, like Wayne, made full use of preview with only one tutee, and during follow up use of preview also fluctuated.

Delayed Attention was used once by John during baseline measurement, and its use varied considerably during intervention. All tutors generally scored at above 50% with Mark's use being above 77%. Follow up scores for all tutors reflected a drop in use, with the exception of Mark whose scores remained similar to the intervention phase.

Phonics. Mark was the tutor to use phonics prior to its introduction and did so twice. Following its introduction both Mark and Wayne used phonics consistently more than 50% of the time, while John scored 0% twice. Follow up scores for both John and Wayne showed a decline in use, but Mark's scores were similar to those during intervention.

Overcorrection was not used at all during baseline measurements. After its introduction, both Mark and Wayne used it consistently more than 83% of the time. John's scores fluctuated between 0-100%. Follow up scores for all tutors showed a drop in use.

Tutee Response

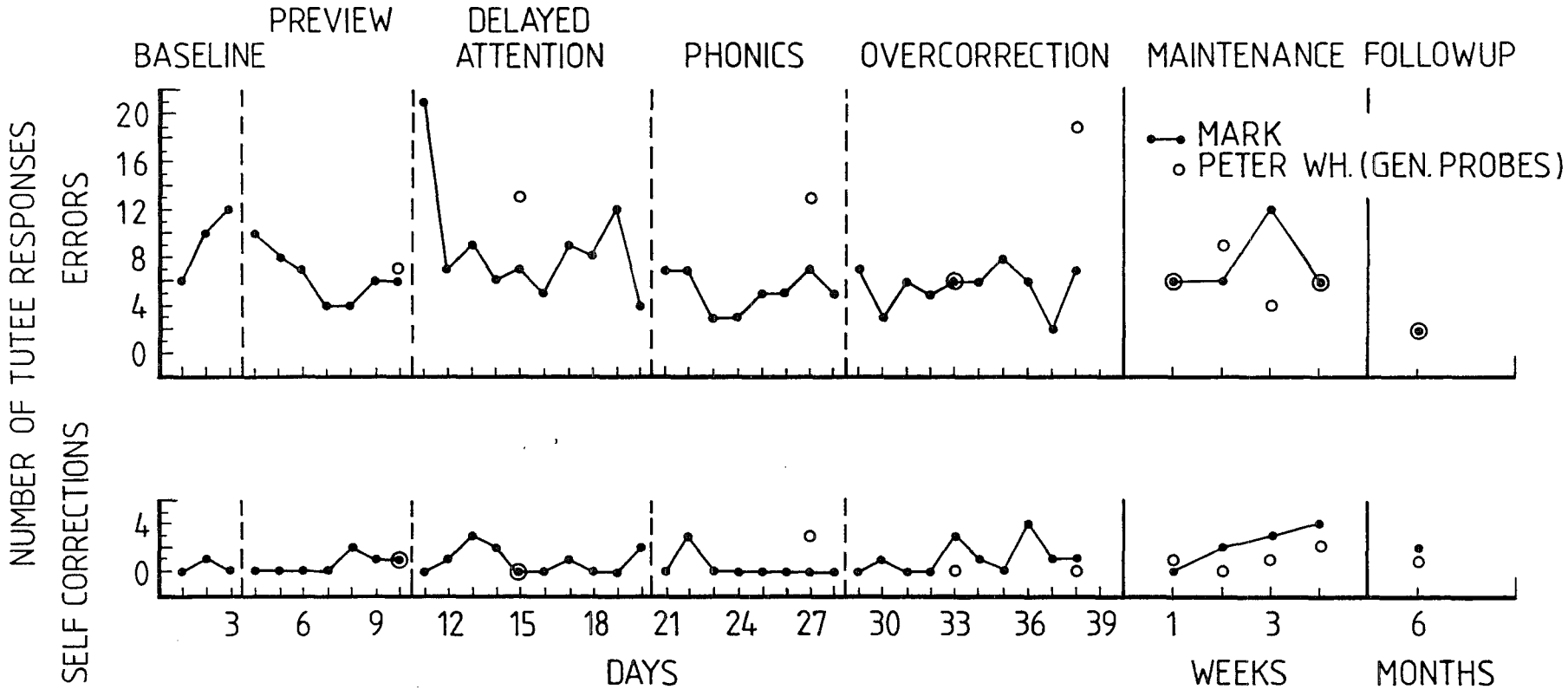
Error Rates. As Figure 6 shows, error rates are varied. Across tutoring procedures, error rates for Mark,

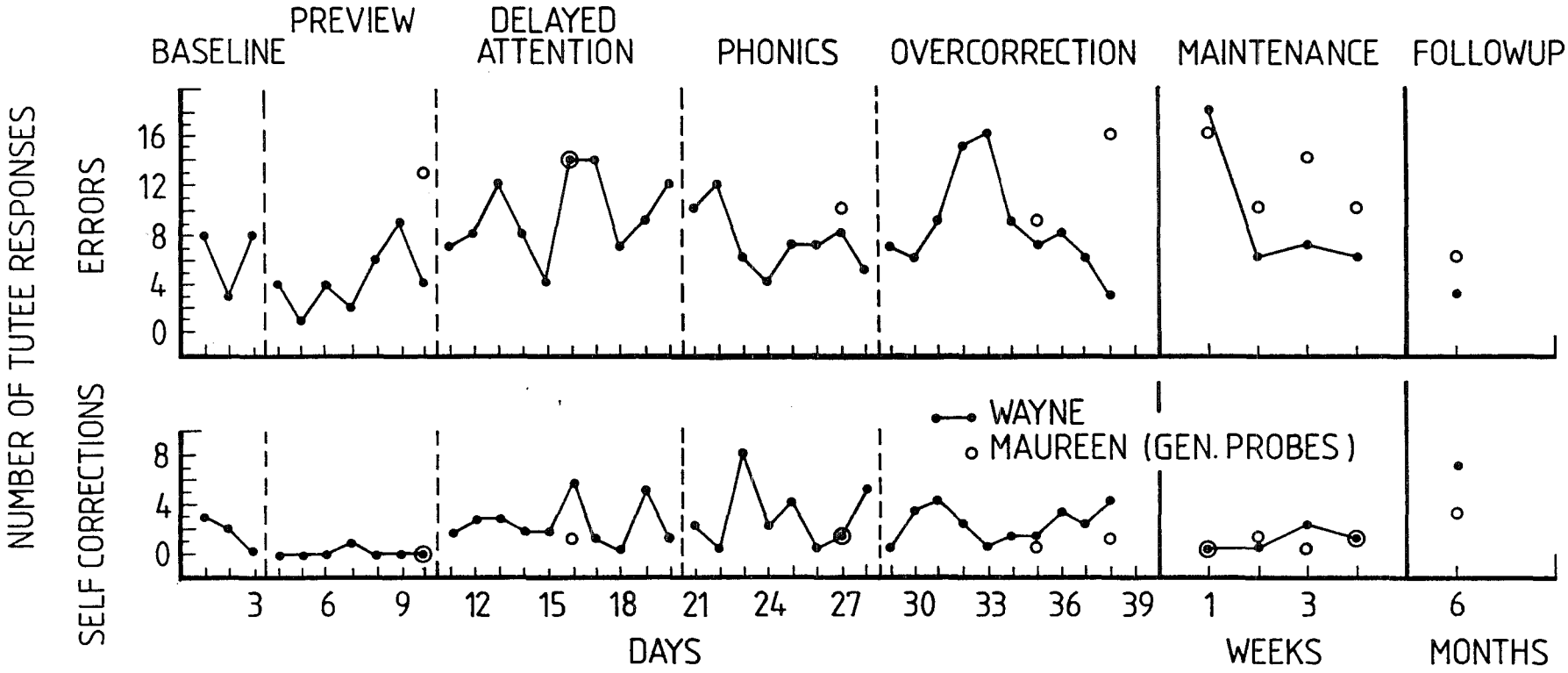
---

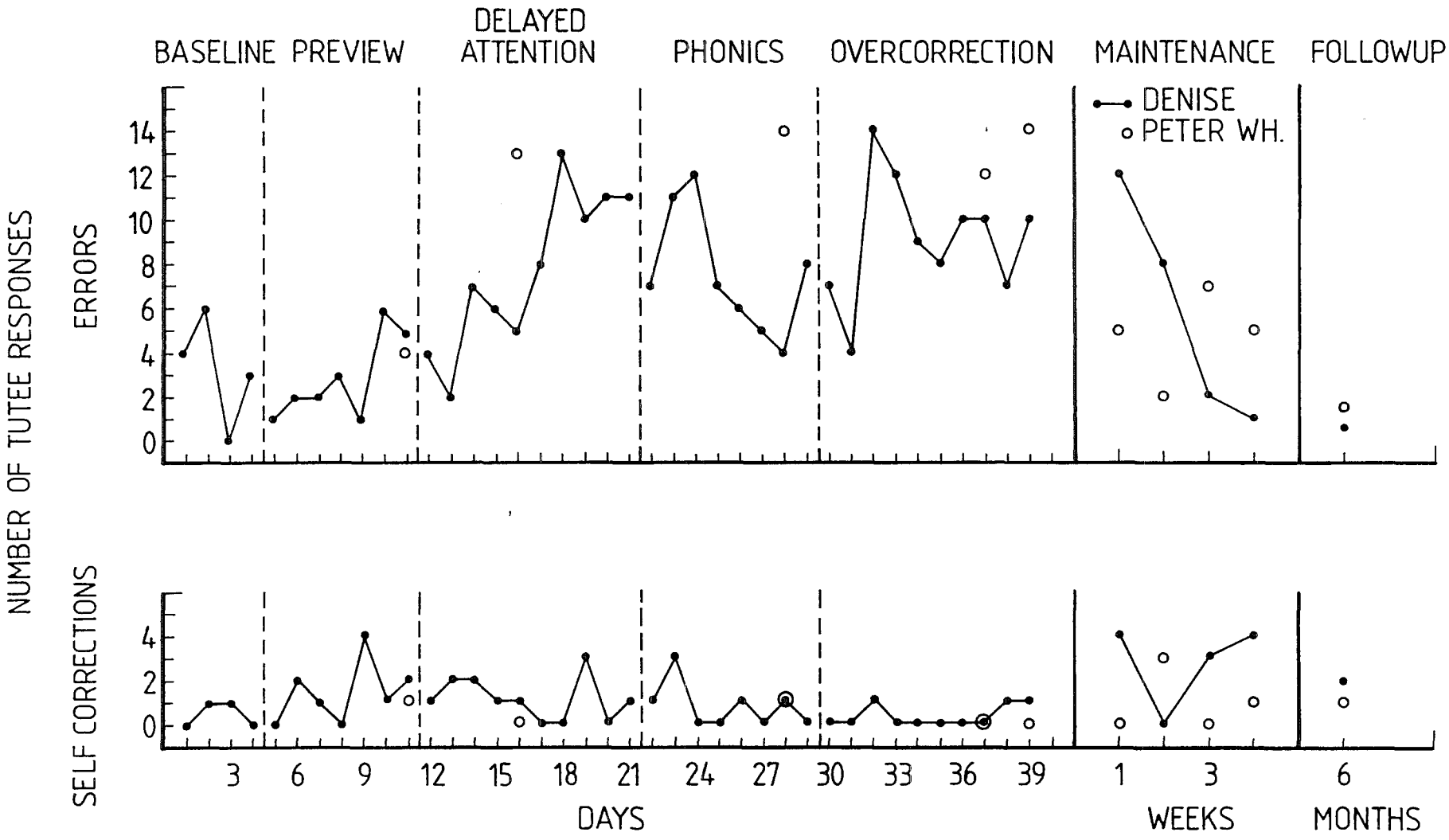
Insert Figure 6 and Table 10 about here

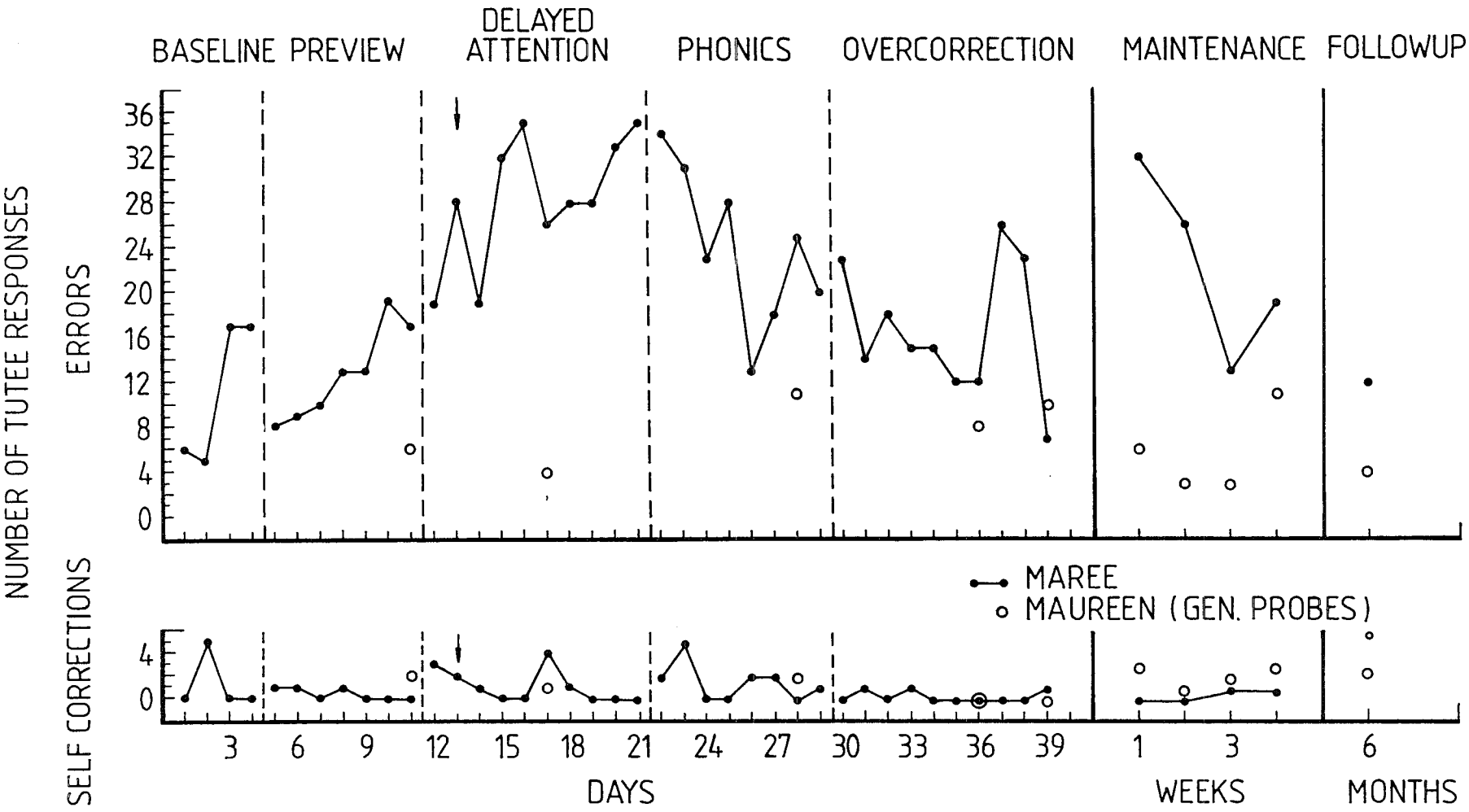
Brendon, and Peter decreased. Error scores tended to peak during delayed attention (Maree, Brendon and Wayne), or

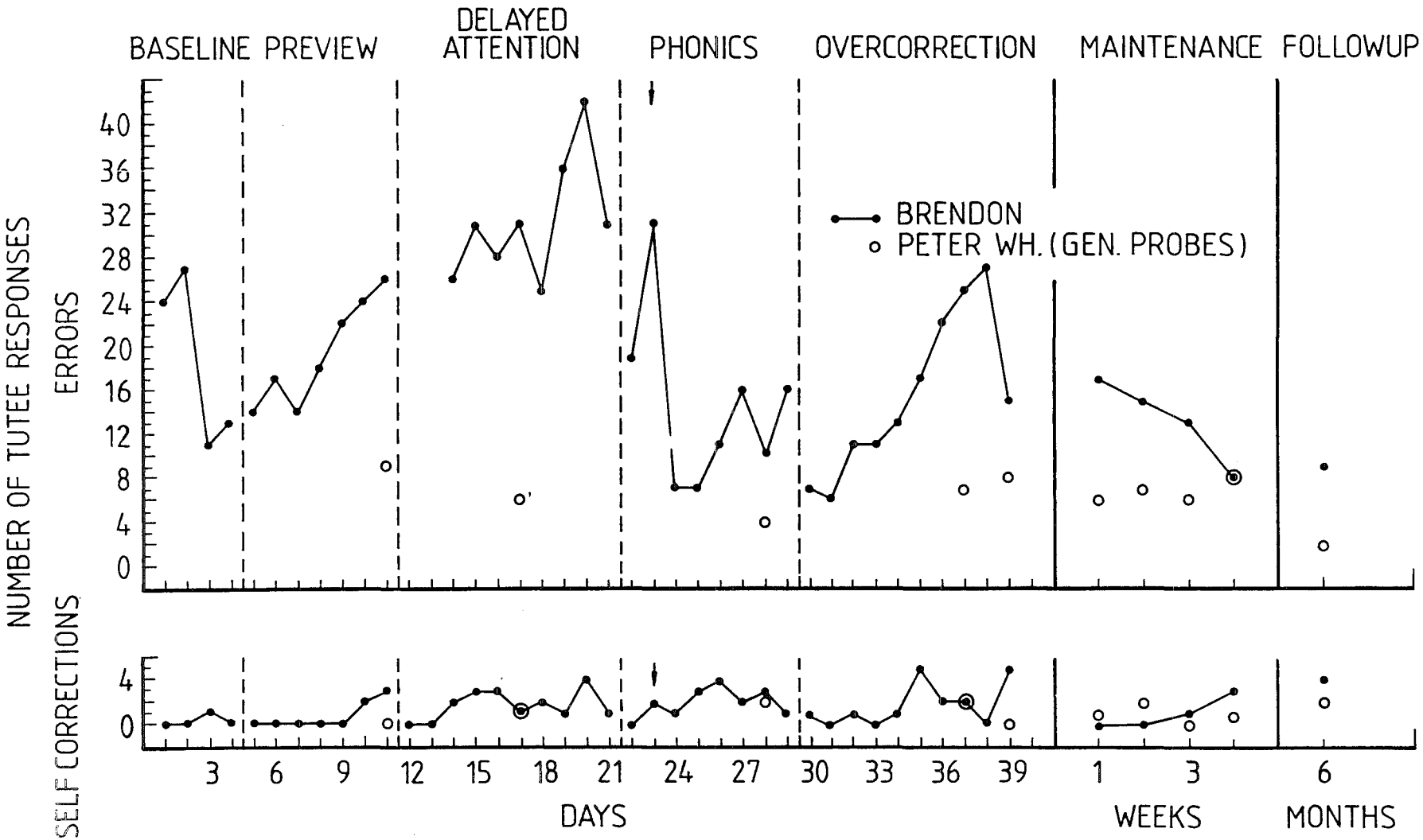
Figure 6. Tutees' errors and self-corrections per 100 words. Arrows indicate changes in tutees' reading levels. Gaps indicate days missed.


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
MARK
PETER WH. (GEN. PROBES)
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
20
16
12
8
4
0
4
0
3
6
9
12
15
18
21
24
27
30
33
36
39
1
3
6
DAYS
WEEKS
MONTHS


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
16
12
8
4
0
8
4
0
WAYNE
MAUREEN (GEN. PROBES)
3 6 9 12 15 18 21 24 27 30 33 36 39 1 3 6
DAYS
WEEKS
MONTHS


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
DENISE
PETER WH.
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
0
2
4
6
8
10
12
14
3
6
9
12
15
18
21
24
27
30
33
36
39
1
3
6
DAYS
WEEKS
MONTHS


BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
36
32
28
24
20
16
12
8
4
0
4
0
MAREE
MAUREEN (GEN. PROBES)
3
6
9
12
15
18
21
24
27
30
33
36
39
1
3
6
DAYS
WEEKS
MONTHS


BASELINE PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
BRENDON
PETER WH. (GEN. PROBES)
40
36
32
28
24
20
16
12
8
4
0
4
0
3
6
9
12
15
18
21
24
27
30
33
36
39
1
3
6
DAYS
WEEKS
MONTHS

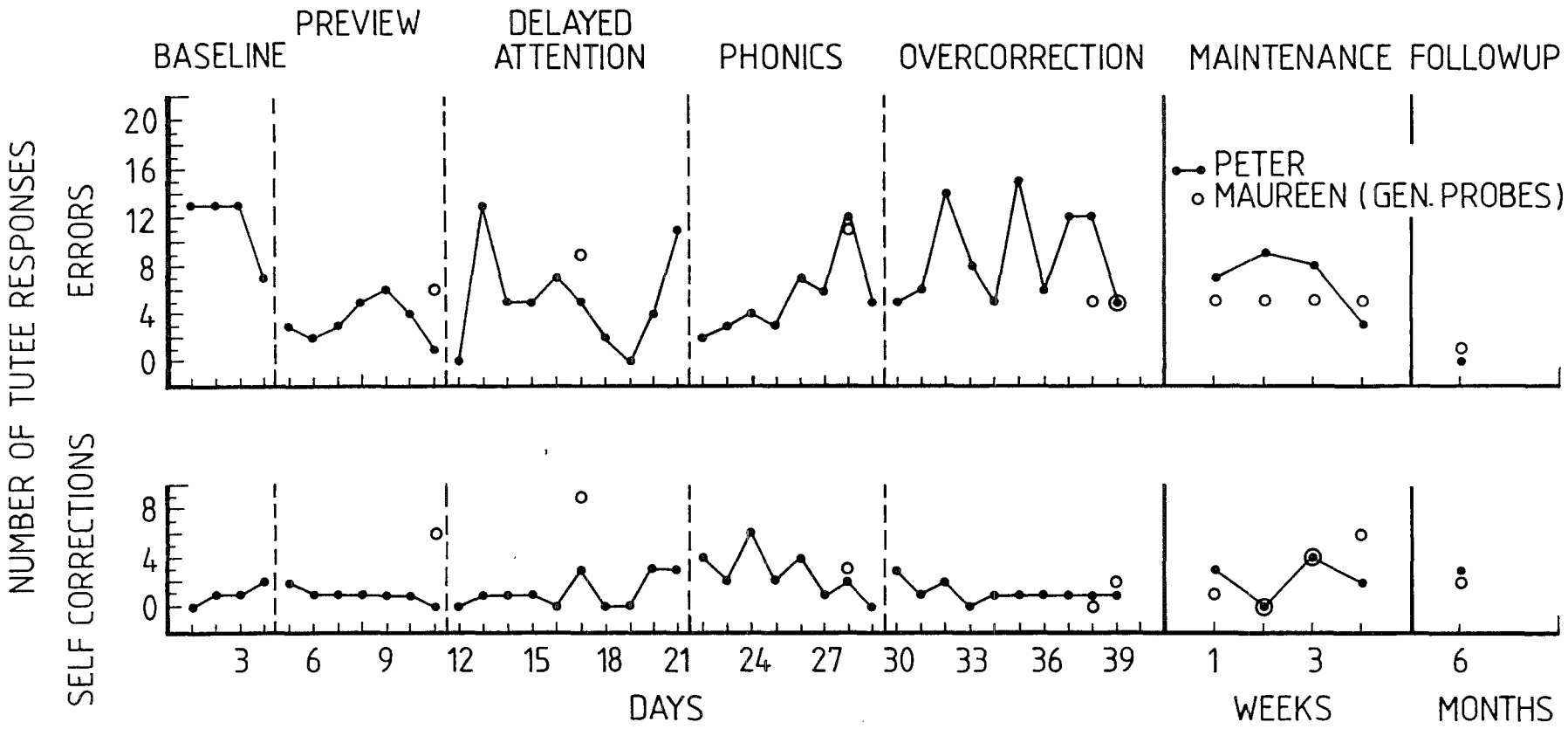

BASELINE
PREVIEW
DELAYED ATTENTION
PHONICS
OVERCORRECTION
MAINTENANCE
FOLLOWUP
NUMBER OF TUTEE RESPONSES
ERRORS
SELF CORRECTIONS
20
16
12
8
4
0
8
4
0
PETER
MAUREEN (GEN. PROBES)
3
6
9
12
15
18
21
24
27
30
33
36
39
1
3
6
DAYS
WEEKS
MONTHS

Table 10

Mean Number of Tutees' Errors and Self-Corrections

	Baseline	Preview	Delayed attention	Phonics	Overcorrection	Maintenance	Follow up[a]
Errors							
Mark	9.3	6.4	8.8	5.3	5.6	7.5	2
Wayne	6.3	4.3	9.5	7.6	8.6	9.3	3
Denise	3.2	2.9	6.9	7.5	9.1	5.8	1
Maree	11.3	12.7	28.3	19.2	18.5	22.5	12
Brendon	18.8	19.3	25.0	14.6	16.1	13.3	9
Peter	11.5	3.4	5.2	6.6	8.8	6.8	0
Self-Corrections							
Mark	0.3	0.6	1.7	2.0	1.7	1.0	2
Wayne	1.6	1.4	2.5	2.8	2.0	0.8	7
Denise	0.5	1.4	1.1	0.6	0.3	2.8	2
Maree	1.3	0.4	1.1	1.5	0.3	0.5	6
Brendon	0.2	0.7	1.7	2.0	1.0	1.0	4
Peter	1.0	1.0	1.4	1.3	1.2	2.3	3

[a]Data are from one 6-month follow up

overcorrection (Peter and Denise).

Self-Correction Rates. For all tutees except Wayne, self-correction rates increased from baseline through to follow up. Wayne's score was highest during overcorrection but dropped at follow up.

Experimenter Prompts

As shown in Table 11, prompts to tutors increase from baseline through follow up, with peaks occurring during different phases for all. Preview was the only phase during which scores were consistently lower, for all tutors.

Insert Table 11 about here

DISCUSSION

The data in Table 9 show that moderately mentally retarded adults can be trained to use a behavioural package to tutor other retarded adults. Table 9 shows that tutoring increased self-correction rates and for over half of the tutees, decreased error rates, thus increasing independent reading skills for the tutees. Table 11 shows that experimenter prompts decreased towards the end of the intervention period. For five pairs, prompting was highest during the phonics intervention, while for one pair, prompting was highest during the delayed attention intervention. Comparison of Tables 9 and 11 show that for some tutors, highest use scores correspond with highest prompting rates. For example, Wayne tutoring Brendon had his highest percentage use of skill during delayed attention, but also received his highest number of prompts during this period. A similar correspondence occurs for John tutoring Mark, and for Wayne tutoring Peter.

Table 11

Mean number of experimenter prompts used with tutors

Tutor-Tutee	Baseline	Preview	Delayed Attention	Phonics	Overcorrection	Maintenance
John & Wayne	0.0	1.0	2.9	3.0	5.2	3.0
John & Mark	0.0	0.9	3.5	5.4	2.7	3.8
Mark & Denise	0.0	0.14	0.9	2.3	0.5	1.0
Mark & Maree	0.0	0.14	1.9	4.0	1.6	1.5
Wayne & Brendon	0.0	1.0	9.4	4.9	7.6	3.0
Wayne & Peter	0.3	1.6	1.2	3.5	4.7	2.5

Prompts to tutors during generalisation probes show no spontaneous generalised use of skills across tutees. This indicates that the tutor pairs required consistent supervision throughout the intervention and follow up periods.

There were some difficulties with personalities, especially with John, who at the apex of the pyramid was the most crucial subject for each day's reading session. Some care was taken matching Mark and Wayne with tutees, since the two male tutees expressed a preference for reading with Wayne, and Mark expressed a preference for tutoring females. There were clashes between John and Mark, and reading sessions with this pair were often disrupted.

The failure to generalise the use of their skills indicated a need for further planning for generalisation. Ideally, a programme might incorporate the fading of prompting, and prior attention to matching of tutors to tutees. In addition, the fading of supervision might also be incorporated.

DISCUSSION

The studies in this thesis were aimed at assessing the efficacy of a package of four behavioural skills already shown to be successful individually in reducing oral reading errors and increasing self-corrections. In addition, it was hoped that differing populations could be trained in these skills to tutor in reading. With concern for the increasing cost of education, the viability of reduced professional supervision was explored.

Issues to be covered in this section are: the successful use of the four skills (preview, delayed attention, phonics and overcorrection); the training of different populations to serve as tutors; the training in individual tutor-pairs versus a group training format; the need for maintenance training; and the delayed arrival of effects whereby tutees maintained their independent reading skills, reducing error rates and increasing self-correction rates.

All three studies attested to the efficacy of the behavioural package. Each intervention was shown to be more effective than a no-treatment control; tutees' error rates decreased, while self-correction rates increased. Use of skills by tutors fluctuated in all three studies, but were maintained at a rate above that of baseline, thus confirming the possibility of training several different populations (paraprofessional aides, parents and moderately mentally retarded adults) to tutor in reading.

Tutors' use of training skills during maintenance indicated the need for programming maintenance training since all their scores dropped after the final intervention.

Independent reading skills for most tutees at the final follow up measure had continued to improve - a trend made apparent by the large increase in self-correction scores and use of phonics.

The technique of previewing as an antecedent intervention has been researched a number of times and found to be successful. Glynn (1982) has described the changing of academic behaviour through the manipulation of antecedent stimuli or setting events. Examples of this are: response priming (Rowbury, Baer, & Baer, 1976), pacing of instruction (Koegal, Dunlap, & Dyer, 1980). A number of experiments have shown previewing to be effective in the reduction of oral reading errors and the increase of self-corrections (Singh & Singh, 1984, 1986b; Wong & McNaughton, 1980). This may be explained by the observation that contextual cues (as a class of antecedent stimuli) are considered to be important variables in proficient reading (Clay, 1979; Goodman, 1967). In the previewing studies, contextual cues were given by discussing the reading material prior to the subject's reading of the text. Prior to the research by Singh and Singh (1984, 1986b) there was little evidence to suggest that previewing would be effective with mentally retarded children. In addition, there was no evidence to support the use of previewing with moderately retarded adults.

The efficacy of previewing is explained using the prediction model originally described by McConkie and Rayner (1976). The proficient reader attends mostly to syntactical and contextual cues, predicts ahead, samples enough graphic information to support their predictions. When contextual

cues are available and are highly relevant to the text, this response strategy may be the most effective of several strategies. It may be that proficiency is dependent on the integration of attention to both contextual and graphic cues so that efficient use is made of the most informative cue source (Clay, 1979). There are differences in the ability to attend to contextual cues: high progress early readers are more likely to self-correct, especially errors affecting ongoing meaning (Clay, 1979; Goodman & Burke, 1973). Wong and McNaughton (1980) explain this by the observation that self regulation in the form of self-correction is more likely to occur in the presence of contextual information. Self-correction is also noted to have a self-instructional outcome (McNaughton & Glynn, 1979). Previewing then, as an antecedent stimulus providing contextual cues, can draw attention to people, places, sequence of events, unfamiliar experiences and vocabulary items. Most probably it is for this reason that previewing successfully contributed to the reduction of oral reading errors and an increase in self-corrections when the behavioural package was used.

The principle of delayed attention to error is at variance with a tenet existing as the foundation of behavioral science: that responses are maximally affected by consequent stimuli, whether they act as reinforcers or punishers. Typically, a contingent stimulus being used to alter a response is presented as soon as possible after the response. However, with complex behaviour sequences an immediate consequent stimulus may well alter other important responses. For example, Halle, Baer, and Spradlin (1981)

found that spoken requests by children occurred at very low intervals when the children's requirements were attended to immediately by the teacher. When there were delays in attention to requirements, there were large increases in appropriate requests. During instruction, teachers often respond more to errors than to accurate performance. This is especially true in reading instruction (Allington, 1980; Gumperz & Hernandez-Chavez, 1972; Weinstein, 1976). McNaughton and Delquadri (1978) found that tutor attention to errors can increase the accuracy of oral reading, yet under some conditions instructor attention to errors can increase error responses (Sajwaj & Knight, 1971). There is evidence that a delaying of attention produces greater accuracy than immediate attention to error (McNaughton, 1981; McNaughton & Glynn, 1981). In these studies immediate feedback to errors was associated with a greater error score than that associated with delayed feedback.

Klein (1976) and Wildman and Kling (1979) have noted that immediate attention interferes with reading accuracy by firstly restricting the reader's opportunity to attend to semantic and syntactic cues following the error. These cues are important because they inform the reader of a change in meaning of the text. Self-corrections are triggered by the mismatches between incorrect oral responses and contextual cues. Teacher interruptions immediately following an error would impede this progress. Therefore, readers have little chance to actively monitor meaning or solve mismatches. In addition there would be little opportunity to self-instruct by anticipating words leading to accurate identification (Klein, 1976; Wildman &

Kling, 1979). Given consistent immediate attention to errors, readers may even come to see words as stimuli to be processed only in isolation, rather than having different functions in different contexts.

Delayed attention to errors has been investigated further by Singh and Singh (1985). In this study a no-treatment control was also used to determine the effects of non-attendance to errors. The subjects were moderately mentally retarded, and data were presented for each individual subject. While both immediate and delayed attention to errors reduced the number of uncorrected oral reading errors and increased the number of self-corrections, delayed attention produced greater changes than immediate attention. When only delayed attention was used, errors remained at a low level, while self-corrections increased. In this study, delayed attention may well have been successful because the subjects were able to match contextual cues given in the previewing condition, with the text, and detect mismatches. They also had time to assimilate information gained from the words in the text, and to attempt self-corrections.

The word analysis (or phonics) component of the studies had less hard evidence to support its use in this programme. The literature on phonics is scarce and there is little evidence regarding its efficacy with mentally retarded adults. In a comprehensive review of reading acquisition and remediation in mentally retarded persons (Singh & Singh, 1985), it was noted that the bulk of the literature deals with ways in which word recognition skills can be taught. Those who support the phonics approach

usually cite Chall (1983), who found phonics to be superior to the whole-word approach. Despite this finding, the whole word approach is usually the one most widely used in basal readers.

Sulzbacher and Kidder (1979) suggested that the efficacy of the remedial method is related to retardation level of the readers and that phonics is more suitable at the higher IQ levels while the whole word approach works better for the more severely retarded. In an alternating treatments design, Singh and Singh (1985) found word analysis to be superior to word supply in reducing oral reading errors. For half of their subjects, the increases were greater under the word supply condition and for the other half self-corrections were greater under the word analysis condition. In this experiment word analysis was equated with a phonics approach to error correction by sounding the word out. In previous studies comparing word analysis with other skills such as word supply (Meyer, 1982; Rose, McEntire, & Dowdy, 1982) the results showed word analysis to be of equivocal value as an error correction procedure. In these studies follow up measures were not cited. This omission is of relevance as time may be an important factor in the consolidation of skills.

In the present studies, phonics was found to be the most difficult intervention to instruct the tutors to use. For the moderately retarded tutors it was necessary to break the skill down into several simple steps: the initial sound, the final sound and the middle consonant or sound blend. Each step was taught sequentially with time allowed for role modelling so that the tutors were familiar with the process.

For all tutor populations it was necessary to model the behaviour before they were able to use the skill. Throughout the intervention phase phonics was seen as a difficult skill to use and it seemed as if it would not be successful. However, at the 6 month follow up check it was encouraging to find the independent use of phonics/word analysis by the tutees. It may well be that previous data which contradicts the use of phonics with the moderately retarded (Sulzbacher & Kidder, 1979) did not take into account the possibility that time may help consolidate skills.

The last procedure, overcorrection, has been used extensively with a variety of behaviours. Foxx and Jones (1978) used overcorrection procedures as a part of a spelling remediation package. Accurate spelling was reinforced while errors resulted in overcorrection. As a result, correct spelling increased. Overcorrection has recently been used as a remedial technique with reading (Singh et al., 1984, Singh & Singh, 1986a, 1986b). Singh et al. (1984) found that when overcorrection was combined with positive reinforcement for accuracy, oral reading errors decreased more than when overcorrection was used alone, or in a no-treatment condition. Singh and Singh (1986a) found overcorrection to be more effective than drill in reducing oral reading errors although retention of corrected errors was marginally better under drill than overcorrection. Singh and Singh (1986b) used overcorrection in a behavioural package, combined with preview and delayed attention to investigate the effects on oral reading errors and comprehension. Oral reading errors decreased, and during the course of the study comprehension scores increased.

One of the reasons for the efficacy of overcorrection may be that the errors are corrected in context rather than isolation. All tutees expressed a dislike for the overcorrection procedure which should ideally have led to an increase in self-correction and a decrease in errors. On the contrary, in one study self-corrections decreased, in one self-correction did not vary noticeably, and in one self-corrections increased. Errors, too, varied from previous research findings. In all three studies there were some increases in errors during the overcorrection intervention. It is not clear why this occurred. It may be that resistance to this particular intervention was high enough to influence responding during this phase. Many tutees refused at first to repeat the correct word but did so after prompting. The adult tutees especially, remarked on the aversiveness of the procedures but did not in general modify their responses. Nevertheless for most of the tutees, errors decreased from baseline through to the final six month post treatment check, while self-corrections increased. Maree in the third study was the exception, showing an increase in errors.

It is clear from the data shown in Table 11 of experimenter prompts that continued supervision was required for the tutors to perform on target. Comparing the scores, however, some tailing-off of scores had occurred by the maintenance stage, indicating that supervision may well be faded as the tutors' use of skills is shaped. Future research could be directed at the fading of prompts. This study contributes to existing literature on remedial reading with moderately retarded adults by supporting the findings

of previous studies which report the four behavioural skills to be successful when used in isolation. In addition, the finding that six months later the adults were using phonics to aid independent reading, points the way for further exploration of phonics or word-analysis as a method of remedial reading instruction with the moderately retarded population.

The variability of results between individuals indicates the need for sensitivity to factors unaccounted for in this study. These included past learning experiences for the tutees, level of self-confidence and self-efficacy experienced during the study, the possible use of reinforcers to enhance performance of both tutors and tutees, time taken to learn error correction procedures, and the dynamics of interactions between tutee and tutor. Future research could most likely add to existing literature by acknowledging and addressing these factors.

The next issue to be covered addresses the training of different populations to serve as tutors. Kalfus (1984) has suggested some guidelines for choosing peer tutors, which I believe apply to the selection of any tutor group. The tutor must be interested and motivated to participate in the programme, be verbal and have speech intelligible to his tutees. Strain, Kerr and Ragland (1981) have suggested that the tutor should have a fairly large vocabulary and be able to follow directions consistently. It is also important for the tutor to demonstrate a natural rate of reinforcement, be helpful and persistent, and be able to learn correct responses (Gerber & Kauffman, 1981). Factors affecting the outcome of tutoring programmes include sex-

pairing, tutor-tutee age differences, race and socio-economic status, as well as training of tutors.

Non-professional aides have successfully been trained to tutor in various subjects. Feldman, Bowman, and Feyen (1983) explored a community tutoring service which used behaviourally-oriented tutoring procedures in differing situations: in-house, after school, summer-school and in-school. In three separate studies, students were tutored by parents, teachers and volunteers. Another study assessed a course which was designed to teach parents how to tutor their children in reading. All tutors received formal training and matched controls were employed for each tutee. Standardised tests, administered post-treatment, showed reading improvements and that all groups of tutors had been trained effectively. Attitudinal measures showed positive changes in the children's confidence, self-esteem, and academic motivation. Other paraprofessional aides have successfully been trained to tutor in toothbrushing (Horner & Keilitz, 1975) and vocational skills (Koop, Martin, Yu, & Suthons, 1980).

There have been some New Zealand studies which also support the use of aides to tutor in reading. Coatsworth, Smith, and Parsonson (1985) reported the successful training of residential staff as remedial reading tutors, and Glynn and McNaughton (1985) reviewed 11 studies based on his study (Glynn et al., 1979) designed to help parents to tutor their children in reading. He concluded that a wide range of tutors, parents, childcare workers, adolescents, and peers could be trained to tutor using his procedure.

Other researchers have reported the successful training of parents as tutors in reading (Criscuolo, 1974; Gang &

Poche, 1982; Love & Van Biervliet, 1984; Meacham, 1968-69; Morgan & Lyon, 1979; Raim, 1980; Scott & Ballard, 1983; Searls, Lewis, & Morrow, 1982; Shuck, Ulsh, & Platt, 1983; Sittig, 1982; Tizard, Schofield, & Hewison, 1982). In addition, home-based reinforcement has been used to implement a successful remedial programme in which peers tutored in reading (Trovato & Bucher, 1980).

There are a number of reasons why parental involvement is of value to the academic programme. Not only are gains found in the child's school work but other less tangible changes are seen. Raim (1980) found that parents in her study also made gains in reading skills. Where the family speaks a different language to that of the school, parents may also learn more of the child's language skills while tutoring. Parents may experience more positive attitudes to the child's education. In turn, the child becomes more motivated, and the increased contact between parents and teachers is generally viewed with favour (Criscuolo, 1974). It is possible that the tutoring programmes produce a type of Hawthorne effect, however, there is a strong case for giving parents something to do to help their children. Increased parental interest and involvement has been reported to be of benefit by all the researchers listed above. As an extension to this, parents can be trained to modify their natural rate and type of reinforcement to change their children's reading behaviour. Meacham (1968-69) noted the improvement of children's reading when their parents' reinforcement patterns were modified. When one child suddenly reverted to his old behaviour it was found that the father had withdrawn his support for the programme, ably

demonstrating the value of parental involvement.

The parent study in this thesis concurred for the most part with this finding. The exceptions were Val and Ian, who were both eager to help Michelle with her reading but appeared tense and negative both at the laboratory sessions and on the home-taped sessions. Their negative comments appeared to undermine Michelle's confidence and her performance was less than it could have been. In this situation, the modification of parental reinforcement would have been appropriate. When modelling was undertaken by the experimenter, Michelle's responses changed: errors remained at the same rate but self-corrections increased, as did reading rate. Mid-way through the study, Val stopped working with Michelle and did not return to the study. Ian then replaced her, commenting that the two had personality clashes and were unable to work together. At the end of the programme Ian was using more praise as reinforcement for accurate reading, and reported that Michelle was choosing to read more books during her leisure time. This was also reported by the other parents, who added that they had become closer to their children over the course of the programme. Certainly parents are a valuable resource for their children's academic education.

In research regarding peer tutoring, Devin-Sheehan, Feldman and Allen (1976) noted that materials used in tutoring may be less important than the methods used and they concluded that a number of different peer populations could be taught to tutor effectively, gaining in reading skills themselves. Further, they noted the need for comprehensive training of the tutors for the programme to be

effective. A number of studies have reported that low-achievers in reading make gains following the tutoring of younger children in reading (Boraks & Allen, 1977; Chiang, Thorpe, & Darch, 1980; Greer & Polirstok, 1982; Howell & Kaplan, 1978; Limbrick, McNaughton, & Glynn, 1985; Willis, Morris, & Crowder, 1972). Some studies have employed non-handicapped tutors (Elliottyson & Parsonson, 1985; Oakland & Williams, 1975; Russell & Ford, 1983) and others have employed mentally retarded tutors for reading (Cooke, Heron, Heward, & Test, 1980; Mulvaney, Fitzhugh, & Wagner, 1980). Emotionally disturbed tutors have also been employed to teach printing and spelling (Maher, 1984; Stowitschek, Hecimovic, Stowitschek, & Shores, 1982).

With regard to sex-pairing, there seems to be no empirical support for a correlation between sex-pairing and academic gains although attitudes to tutoring and social interaction in general may improve as a result of opposite sex-pairings (Foster, 1972). In this thesis, sex-pairing was an issue for only one tutor, Mark, who expressed both a dislike for tutoring the other two male tutees, and a preference for working with female tutees.

Another issue to be covered concerns the training format used with the tutor pairs. While each tutee received important one-to-one instruction, there are a number of studies which argue against individual training formats with developmentally disabled populations (see Singh, in press). While individual training is effective it may not be the most efficient or cost-effective way of teaching. Further, the student is denied opportunities to learn how to interact in a group, both academically and socially.

There are also students who learn as rapidly in a group training format as individual training (Alberto, Jobes, Sizemore, & Doran, 1980; Koegal & Rincover, 1974; Storm & Willis, 1978). However the outcome may well depend on the type of format used. Brown, Hermanson, Klemme, Haubrich, and Ora (1970) and Kohl, Wilcox, and Karlan (1978) found group training to be more effective than individual training in the acquisition of sight vocabulary and signing respectively. Jenkins, Mayall, Peshka, and Jenkins (1974) found individual training to be more effective on a number of academic tasks.

A number of other variables may affect outcome. These include the type of task taught (e.g., academic vs self-care), type of tutee (normal vs developmentally delayed), and tutor (e.g., teacher vs teachers' aide). Another important consideration is the nature of material to be learned by the students. All comparative studies on individual and group training formats have used the same material, with one exception. Oliver (1983) demonstrated that students learn equally well under either format when the same signs are to be learned by all students. However, learning is more rapid in an individual training format if each student is to learn different signs.

Singh (in press) investigated overcorrection when used in individual training format and group training formats. He found that both individual and group training formats produced fewer oral reading errors than a no-training control, and that the children performed equally well under both formats. Generalisation probe data suggested that the group training format might increase word recognition skills

through incidental learning. In peer tutoring studies, Epstein (1978) investigated the effects of tutoring on reading recognition in learning disabled children. He found that the one-to-one peer tutoring procedure was more effective than a self-instructional procedure, a teacher-instructed group procedure, and a control group. However, the procedures used were unclear, as was the subject description. In addition, long term maintenance and reliability were not included.

It may have been possible to place the tutees in the present studies in group learning situations and expect some incidental learning to occur. In Study 1, where all tutees read the same passages, this may well have been undertaken with only one tutor for all the tutees in a group. Tutees may have learned from other group members' accurate reading and mistakes. The advantages of this training format are obvious. Past recruitment of volunteers to help at the IHC has proved difficult, and the use of remedial reading programmes in which only one tutor is required to work with a group of tutees may well ease the difficulty of providing remedial programmes. In studies 2 and 3, tutees were all reading at different levels and different passages. Group training could well have been less effective, given the nature of the task.

The next issue to be covered is the observation of the need for training to maintain and to generalise the tutor's use of skills. It was observed during the maintenance and follow up conditions in all three studies that the tutors' use of target skills declined over time. To be effective, behavioural change should occur over time, people

and settings (Stokes & Baer, 1977). Generalisation of behaviour change does not always occur spontaneously. Although the need for generalisation has been widely accepted, its programming has not. There is a need to train for generalisation, rather than expect it as an outcome of training procedures.

In this thesis, generalisation probes across tutees were programmed but specific steps to train use of skills across time, settings, and tutees were not.

Stokes and Baer (1977) listed nine categories according to which type of generalisation can be programmed for behavioural change. The most frequently used method has been of the 'Train and Hope' variety, where generalisation following behaviour change is expected but not usually experienced. The steps that could have been taken to ensure generalisation across time, subjects, and settings would have been to train for it specifically: (1) by varying the tutor-tutee pairings, to make more use of generalisation probes and to vary each probe, giving the tutor as much exposure to different tutees as possible; (2) by adding a reinforcement contingency to the on-task behaviour of the tutors which might then induce tutors to maintain a high rate of behaviour early in the study. Later this reinforcement could be faded or switched, in the case of the peer training study, to natural maintaining contingencies; and (3) another possible step might have been to fade the presence of the experimenter in all three studies, while employing the tutors themselves to monitor each other's reading sessions.

Gartner, Kohler and Riessman (1971) have asserted that children learn far more when performing in the teaching role than as students. It may well be that the tutors in all three studies could have made gains to their tutoring behaviours if employed to supervise each other's reading sessions.

A last point to be made is that 'booster' sessions may well be appropriate - not merely to return the tutors' effectiveness to its highest levels, but to give the tutor appropriate support, and reinforcement for the task being performed.

The six-month follow up measure was significant for two reasons. First, it was seen that the tutees' error rates had reduced since treatment and maintenance, while self-corrections had increased. Second, the tutees' use of phonics to aid in self-correcting had also increased. These two points are important because they indicate that significant changes can and do occur long after the conclusion of the remedial programme. Had follow up measures not been taken at the six-month period, data would still have indicated increases in self-corrections, but not as such a resounding success as was indicated by that final measure. This may mean that studies which involve moderately retarded persons could in future programme to anticipate a delayed arrival of effects rather than expecting the most significant of behaviour changes to occur during the intervention programme itself.

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APPENDIX A

Oral Reading Record

Reader & Tutor Behaviours

Tutor: _____ Date: _____ Reading Sample: _____

Trainee: _____ No. of Words: _____ Session Number: _____ Exptal phase _____

Trainee (Reader Behaviour)

	Word in text	Error	Hesitation	Transposition of words	Substitution	Mispronunciation	Omission	Addition	Repetition	Self-Correction		Attention to Error	Repetition	Word Supply	Word Analysis	Preview	Attention Delayed	Phonics	Overcorrection	Praise				
																				Word Attempted	Correct Reading	Self Correction	Correct Following Prompt	Other

APPENDIX B

PREVIEWING

The first treatment we want to use with _____ is previewing. This is simply providing a background to the passage that is to be read each session. Discuss the package using the illustrations as guides and bring up any new words in the text, putting them in context but without actually pointing to the word.

Ask _____ questions regarding the pictures and encourage him/her to make comments or questions about the story. Give verbal praise for each comment and correctly answered question.

Read a 100-word passage each session.

DELAY

The second phase of the project introduces a form of correction called 'Delay'. This is giving delayed attention to reading errors. Rather than correcting _____ immediately after an error, correct at the end of the sentence in which the error occurred. If he pauses after an error, correct it between 10 and 15 seconds later. If he pauses before a word tell him to 'try it' and if wrong correct it 10 to 15 seconds later as well.

Tell _____ at the beginning of the week what procedure you will be using, for example: "Read the passage for today, if you make any errors I will tell you at the end of the sentence what the correct word is. Try not to make any mistakes."

Read a 100-word passage as usual and continue to use the Preview technique learnt last week.

PHONIC

The next treatment phase introduces phonics or Word Analysis which will encourage _____ to sound out words that he does not know.

When he makes an error, use the 'Delay' procedure learnt last week i.e., waiting until the end of the sentence or between 10 and 15 seconds before attending to the error word. Ask him what the word is and if he does not know, get him to break the word into syllables and sound these out. If he still has difficulty, ask what the word begins with and sound out each element of the word with him.

Try not to have too long a break between sounds as this can distort the word, for example, 'par--tic--u--lar' continuing the syllable right up till the next syllable is pronounced rather than 'par - tic - u - lar'.

When he has sounded the word out, encourage him to combine the sounds together to say the whole word. After he has done this correctly, ask him to continue reading the passage.

You may assist him in sounding out the word, but encourage him to try for himself.

As before, Preview the text and ask questions after he has read. Read a 100-word passage and before he starts to read indicate which procedure you will be using in correcting his errors. For example: "If you make a mistake I will help you at the end of the sentence to sound out the word and then you can say the whole word before reading on".

OVERCORRECTION

The last treatment phase is called Positive Practice or Overcorrection.

For this, do as you usually would:

Preview the session to be read. If _____ makes an error, wait until the end of the sentence, or if she pauses wait 10-15 seconds and then use the Phonics treatment learnt last time. Have _____ break the word into sounds and then combine them into the word.

The Positive Practice aspect is pointing to the word and repeating it five times. After _____ has done this she can read the whole sentence again.

Do a 100-word session each time and question at the end.